

CONSTRUCTION METHODS AND EQUIPMENT

35 CENTS



Christmas 1953

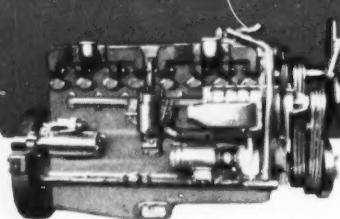
WHY UNDER-POWER YOUR EQUIPMENT



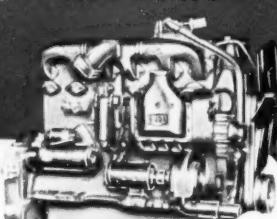
when **BIG**
displacement
Buda Diesels
give you so many
advantages?



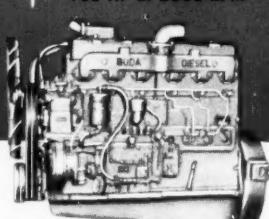
6-DAE-1125 Supercharged
380 HP at 2100 RPM



6-DAE-844 Supercharged
380 HP at 2100 RPM



6-DA-779
385 HP at 2000 RPM



BUDA Diesel Advantage:

- **12 to 18% MORE
HORSEPOWER AT NORMAL
OPERATING SPEEDS**
- **10 to 17% MORE USEABLE
TORQUE**
- **SMOOTHER, QUIETER
OPERATION**
- **EXCLUSIVE DYNASTRIAL
COMBUSTION**

Benefit To You:

Faster trips . . . heaped loads . . . more production . . . greater reserve . . . lower cost per yard

Greater lugger ability . . . less shifting and jerking . . . longer equipment life . . . reduced maintenance and downtime

Increased operator comfort . . . less exhaust fumes and smoke . . . greater efficiency . . . more production per shift

More horsepower per gallon of fuel . . . lower all around fuel costs

You can't afford *not* to know all the facts about BIG displacement Buda Diesels—the engines that will increase your production while reducing costs on every yard you move. Ask your nearby Buda Engine Distributor. He'll be glad to supply the facts. *The Buda Company, Harvey Illinois. Division of Allis-Chalmers Manufacturing Company.*



BUDA



*a Power-Full and Dependable Engine
FOR EVERY NEED*

RESEARCH KEEPS

B.F. Goodrich

FIRST IN RUBBER



The belt with the built-in shock absorber

THAT's just one of several Euclid Loaders speeding construction on the New York Thruway. Every day hundreds of tons of heavy gravel and clay are dumped on the belt. In tough service like this, the average conveyor belt can't stand the combination of impact, belt speed and abrasion. But construction engineers have found that the B. F. Goodrich belt, with a built-in shock absorber, can outlast by more than 3 times the life that can be expected of ordinary belts.

Here's the reason B. F. Goodrich conveyor belts are setting new records for long life and trouble-free operation on construction jobs of all kinds, in quarries, ore mines and wherever else

shock load is common.

To protect the conveyor belt against shock and impact, B. F. Goodrich has added a patented *Transcord Breaker*. This extra layer of parallel cords in rubber, which is placed across belt width and around the belt edges, increases the adhesion of cover to carcass by 50%. It keeps the cover from tearing off the carcass under severe impact, prevents gouges and cuts from splitting the cover.

Whatever you move by belt—rock, ore, sand, gravel, dirt—there is a B. F. Goodrich conveyor belt that can do it better and for less. Your local BFG distributor can show you how these longer-lasting belts can save money or

use the coupon to send for further information.

**The B. F. Goodrich Company
Dept. M-114, Akron 18, Ohio**

Without cost or obligation, please send information on:

conveyor belts
 other rubber products (name type) _____
 Have a BFG distributor see me.

Name _____

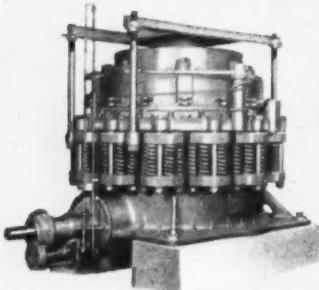
Company _____

Address _____

**B.F. Goodrich
INDUSTRIAL PRODUCTS
DIVISION**

More and More SYMONS® Cone Crushers

... THE MACHINES THAT REVOLUTIONIZED CRUSHING PRACTICE ...



Symons Cone Crushers are built in Standard, Short Head and Intermediate types in capacities from 6 to 900 tons per hour.

For sizing operations, Nordberg offers a broad line of Symons Vibrating Screens and Grizzlies in a wide range of types and sizes to meet practically every separation problem.



● To meet today's challenging competitive problems, successful contractors and producers of crushed aggregate and construction materials must utilize portable plants ... for mobility and ease of transport to the job site is essential.

Symons Cone Crushers and Symons Vibrating Screens have long been widely accepted by successful producers for efficient stationary rock, ore and mineral processing plants ... and now, increasing numbers of successful operators of portable and semi-portable plants are using these sturdy, economical units for big capacity of fine product.

Shown on these pages are just a few typical examples of the way in which Symons Cone Crushers and Screens are serving the contractor.

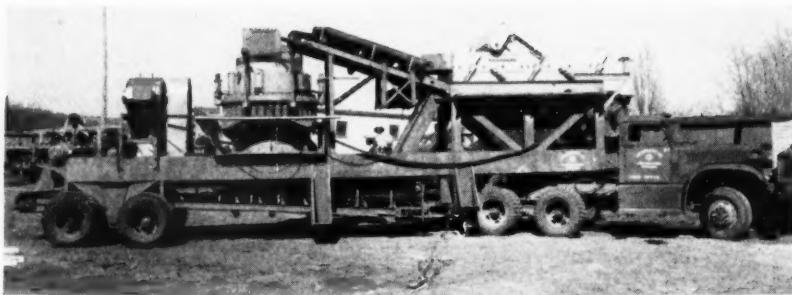
Whether you are a contractor, operator, highway construction engineer, designer or manufacturer, it will pay you to specify and use Symons Crushers and Screens.

Clip and mail the coupon for your copy of the complete Nordberg brochure showing a wide range of suggested portable and semi-portable plant arrangements.

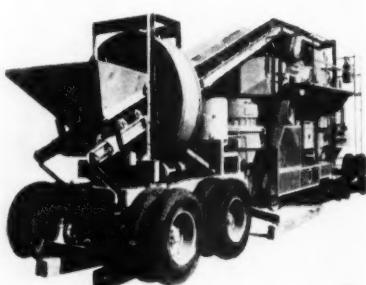
are being installed for Portable and Semi-Portable Service



... and here's how successful



Symons 4' Standard Cone Crusher with conveyor and screen on portable secondary crushing unit operated by F. R. Hewett Co., contractors in Washington.

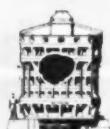


Symons 22" Intermediate Cone Crusher in a complete crushing and screening plant built by a prominent manufacturer of portable plants.



Symons 3' Standard Cone Crusher with power unit and conveyor mounted on a trailer. Locally built in Oregon.

SYMONS ... A REGISTERED NORDBERG TRADEMARK KNOWN THROUGHOUT THE WORLD



SYMONS
GYRATORY CRUSHERS



SYMONS
CONE CRUSHERS



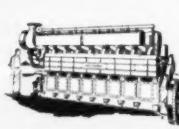
ROTARY KILNS
and COOLERS



SYMONS
'V' SCREENS



SYMONS VIBRATING
GRIZZLIES and SCREENS



DIESEL ENGINES
10 to over 10,000 hp.

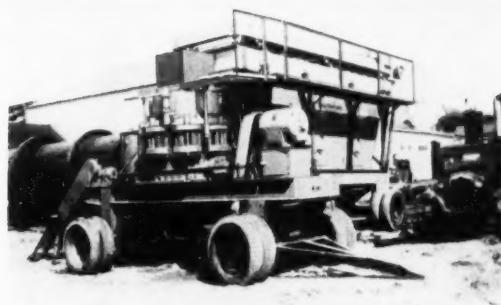


Symons 4' Standard Cone Crusher and double-deck Symons Vibrating Screen—electrically driven—locally built—Thornton Construction Company, Michigan.

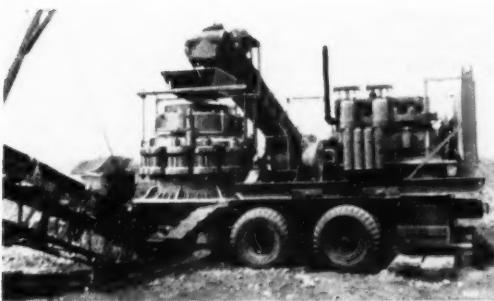
Contractors have MOBILIZED Crushing Operations



F. R. Hewett Construction Company's portable crushing plant with trailer mounted Symons 3' Standard Cone Crusher.



Symons 3' Standard Cone Crusher 4' x 16' double-deck Symons Vibrating Screen, electric-driven, wheel-mounted aggregate plant—locally built—Standard Paving Company, Canada.



Symons 4 1/4' Standard Cone Crusher, Diesel engine powered, large capacity crushing unit—locally built—Canyon Construction Company, Idaho.



Symons 4' Standard Cone Crusher with power unit and conveyor mounted on trailer. Dibble Construction Company Ltd., Canada.

This brochure is full of suggestions for arranging Symons Cone Crushers and Screens with other related equipment to make up complete crushing and screening plants. Mail the coupon for your free copy today.

MAIL THIS COUPON TODAY!

NORDBERG MFG. CO., Milwaukee, Wisconsin
Please send me brochure on Symons Crushers and Screens for use with portable and semi-portable crushing and screening plants.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____

ZONE _____

STATE _____



CS153

NORDBERG MFG. CO., Milwaukee, Wisconsin



NORDBERG



MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG

GREATER SAFETY FOR MEN WHO
PREFER METAL HEAD PROTECTION

BULLARD ALUMINUM SAFETY CAPS & HATS

Famous Bullard shock-absorbing, safety, ribbed crown design now available in rugged aircraft grade aluminum Caps and Hats • Light, strong, comfortable • Exceed 40 pound drop test for resistance • Satin, permanent, no-glare finish • Exclusive Bullard hammock-headband assures proper fit, ample head space and air circulation. Standard winter liners and chin straps fit all models



"SHORTY" CAP

Visor protects the face. Flared brim keeps ears and neck safe from falling objects. No wide brim to interfere with carrying or working in close quarters. Weighs only 10 ounces.



Weighs only 12 ounces. One type headband fits every head. Can be adjusted in 6 seconds to any standard size. New hat cleanliness and comfort restored in minutes with interchangeable headbands.

FREE—write for illustrated folder.

E. D. BULLARD CO.

275 EIGHTH STREET
SAN FRANCISCO 3
CALIFORNIA
Distributors in
principal cities



EVERYTHING
BULLARD
IN SAFETY

(SINCE 1898)

TM'S REG. U.S. PAT. OFF

CONSTRUCTION METHODS AND EQUIPMENT

Volume 35, Number 12

DECEMBER 1953

Established 1919

Pay Dirt in This Issue

Twin Pipelines Cross 4-Mile Straits

Controlled-buoyancy pontoons, roller launchway and big winches team up to pull deep (246 ft) 20-in. lines.

Air Placement Cuts Column Concreting Costs

Steel building columns are encased 28 ft up from the floor by filling forms through the side with a small placer.

Box-Bucket Shovel Ups Paver Output 10%

Machine transfers 80 batches per hr from trucks on shoulder to skip of paver operating between forms.

How to Improve Contractor-Labor Relations

Construction unions hate tricky language that upsets collective bargaining; want help in jurisdictional matters.

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"The Job Goes TWICE AS FAST with 'Incor'"

GRAVESEND HOUSES, Brooklyn, N. Y.

Owner: NEW YORK CITY HOUSING AUTHORITY

General Contractor:

CAYE CONSTRUCTION CO., INC., Brooklyn, N. Y.

Architect: MATTHEW W. DEL GAUDIO, New York

Structural Engineers:

TUCK & EIPERL, New York

Ready-mix 'Incor' Concrete:

COLONIAL SAND & STONE CO., INC., New York

● Assembly-line efficiency in industry has its counterpart in construction, as illustrated in Gravesend Houses, latest in New York City Housing Authority's record-shattering program.

Foundation problems slowed the job—but concreting know-how made up two months' lost time, got the job back on schedule. Walls and slabs above first floor, in the 15 seven-story units, were concreted with 'Incor' 24-Hour Cement.

Well-built forms were filled, stripped, reassembled, on schedules as precise as any automobile assembly line: 105 floors concreted in 66 working days—1.6 floors a day! Contractor's sum-up:

'Incor' was a life-saver . . . the job went twice as fast, thanks to high early strength you can rely on . . . exceptionally smooth surfaces saved on finishing, too.

Point to remember: Today's concreting methods, with an assist from 'Incor',* make available the inherent fire-safety of concrete-frame construction, at faster erection speeds—and lower costs.

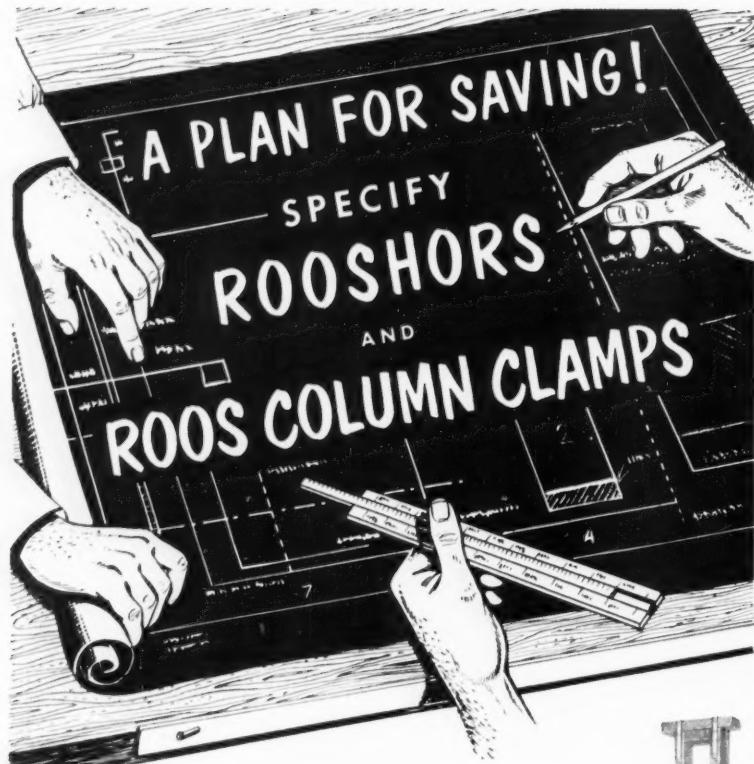
*Reg. U. S. Pat. Off.



LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N. Y. • BETHLEHEM, PA. • BIRMINGHAM, BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • RICHMOND • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 129,000,000 SACKS ANNUAL CAPACITY



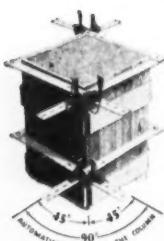
ROOSHORS...

Rooshors save because they can be set faster, cause no delays and may be used over and over, from floor to floor and from job to job. They are instantly adjustable to "hairline" accuracy and have no pins or screw adjustments to cause needless delays. Wooden upper members permit easy fastening of lateral or diagonal bracing. Sizes: 8 ft. to 14 ft.; 7 ft. to 13 ft.; and, 5 ft. to 9 ft.; higher stories are shored with ROOS EXTENSION SHORES . . .



flat steel head on standard adjustable Rooshor into which any length 4x4 may be inserted. Provides adjustability with extension.

Rooshors Have Been Used By Contractors from Coast-to-Coast Over 35 Years.

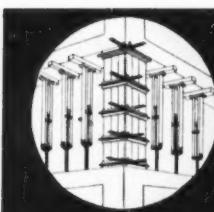


ROOS COLUMN CLAMPS . . .

Roos Column Clamps, consisting of two identical hinged units, save by eliminating waste time and motion in fitting and adjusting. They are foolproof, there is no wrong way to put them on . . . no loose parts to cause needless delays, and a hammer is the only tool needed.

Write today for Bulletin 253

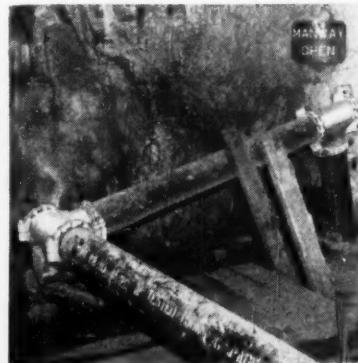
Rooshors and Roos Column Clamps are available for rental with purchase option from warehouse stocks in principal cities.



BAKER-ROOS, INC.
602 W. McCARTY STREET
INDIANAPOLIS 6, INDIANA

* JOB TALK *

... About Methods



T-Formation

"Airborne" concrete, mixed underground and delivered into forms via pipeline, is used extensively by the International Nickel Co. of Canada in its Creighton Mine. Concrete is replacing old timber supports and reinforces new openings under ground.

Compressed air blows the concrete through a 6-in. steel pipe along levels and up and down through changes in levels as far as $\frac{1}{4}$ mi from the mixing plant. T-bends are used at 90-deg turns in the line. An air cushion forming in the dead end of a T greatly reduces abrasion from the fast-moving concrete. The photo shows two T's serving a double bend leading down to another work level.



Tricky Excavating

This Gradall operator literally had to feel his way at the No. 1 Refinery of the Standard Oil Co. of Ohio in Cleveland while digging ditches to relocate sewage, water and product piping. O'Neill Road Construction Co. used a (Continued on page 12)

64

NORTHWESTS

on the
New York Thruway

MT. VERNON CONTRACTING CO.
Healy & Gamino
Working in Rockland County, N.Y.
9 Northwests

SAVIN CONSTRUCTION CORP.
in Green County
and Madison County, N.Y.
4 Northwests

COLLINS BROTHERS
in Albany County
and Herkimer County, N.Y.
7 Northwests

WHITE OAK CONTRACTING CO.
in Schenectady County, N.Y.
2 Northwests

B. PERINI & SONS
in Schenectady County
and Montgomery County, N.Y.
4 Northwests

GRAND VIEW CONSTRUCTION CO.
in Montgomery County, N.Y.
2 Northwests

S. J. GROVES & SONS CO.
in Montgomery County, N.Y.
2 Northwests

SENECA COUNTY
1 Northwest

D. W. WINKLEMAN INC.
in Onondaga County, N.Y.
4 Northwests

ONTARIO COUNTY
2 Northwests

MONROE COUNTY
1 Northwest

ARUTE BROTHERS
in Genesee County, N.Y.
1 Northwest

A. S. WIKSTROM
in Cayuga County, N.Y.
2 Northwests

R. E. DUTCHER
in Monroe County, N.Y.
1 Northwest

C. P. WARD
in Monroe County, N.Y.
1 Northwest

FRAZIER DAVIS CONSTRUCTION CO.
in Erie County, N.Y.
5 Northwests

JOHN ARBORIO
Working near Kingston, N.Y.
3 Northwests

A. H. DAUGHERTY CO.
Working near Newburgh, N.Y.
3 Northwests

L. G. DEFELICE & SON
Working in
Suffern and Herkimer Counties, N.Y.
10 Northwests

* Since this ad was prepared
this figure has increased to 72.

There's a figure to think about. 64 Northwests in the hands of responsible contractors on the New York Thruway. More Northwests than any other make of similar equipment.

The reasons why Northwests are so dominant on construction jobs everywhere are worth your checking into.

Look over the list of Northwest owners on the Thruway. Their names alone form a testimonial to the quality of Northwest performance—a testimonial that is an assurance to future Northwest owners that Northwest will give them the type of service they are looking for.

**NORTHWEST
ENGINEERING COMPANY**
1503 Field Building
135 South LaSalle Street, Chicago 3, Illinois



NORTHWEST

B.F. Goodrich



"Universal tread prevents side-slip," construction foreman reports

THE Kessler Contracting Company does road construction work around Mount Carmel and Shamokin, Pennsylvania. Thirty trucks, 6 scrapers and 6 other units haul loads as heavy as 20 tons over hilly, rut-filled roads where tire skidding and side-slippage is a constant threat.

To avoid this danger, Kessler uses B. F. Goodrich off-the-road tires. Foreman Rufus Steiger (above, right) reports they prevent side-slip, give much better service than any other make of tire.

The B. F. Goodrich Universal tire grips with husky, wedge-shaped cleats. The cleats are non-directional to give positive traction in reverse or forward and to guard against slippage. You pull through the toughest jobs

without wasting time and money on bogged-down trucks. And the tread is made of specially-compounded rubber that resists cuts and snags.

Kessler is able to recap its BFG tires twice—each recap saving the company hundreds of dollars—because of the extra-strong construction. Layers of strong, elastic nylon cords under the tread stretch together to protect the tire body from shocks and bruises. This patented nylon shock shield costs you nothing extra, yet gives you more original tire service, more recappable tires and more hours of service per recap, increased bruise resistance and less danger of tread separation.

See the complete money-saving line of B. F. Goodrich off-the-road tires at

your retailer's store. The address is listed under Tires in the Yellow Pages of your phone book. Or mail the coupon.



*The B. F. Goodrich Company
Tire and Equipment Division
Department TO-287, Akron 18, Ohio*

Please send me:

- Free catalog on B.F. Goodrich off-the-road tires
- Free booklet, "How to get more recaps out of truck tires"
- Name of my nearest retailer.

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

Specify B. F. Goodrich tires when ordering new equipment



T5X Cuts Operating Costs

If engine breakdowns are keeping your operating costs too high...then change to T5X motor oil. Heavy-duty T5X, the amazing *purple* motor oil, can boost your profits by guarding against costly engine breakdowns.

Even under the most *severe* conditions—dust, heat, rain and heavy loads—T5X gives *superior* engine

protection. T5X lubrication protects rings, bearings and other moving parts against wear, and greatly extends overhaul periods.

T5X is made from an unusual combination of the *finest* base stocks and special-purpose compounds. This amazing *purple* oil protects against the clogging effects of sludge. And T5X keeps engines cleaner by

retarding the formation of lacquers and varnish.

Test T5X on your *toughest* job. Compare the performance of T5X with the motor oil you now use. You'll agree with construction men everywhere that T5X lubrication means less wear, lower maintenance costs and greater engine protection under *every* operating condition.

OFFICES: LOS ANGELES: Union Oil Building • NEW YORK: 45 Rockefeller Plaza
ATLANTA: 401 Atlanta National Building • NEW ORLEANS: 644 National Bank of Commerce Building

• CHICAGO: 1612 Bankers Building

UNION OIL 76 COMPANY OF CALIFORNIA

T5X motor oil was developed by the makers of UNOBA—the original multi-purpose grease.

NOW!

NEW 1954 CHEVROLET TRUCKS



Completely new—the most powerful, finest performing, best-looking Advance-Design trucks ever built!

Here's America's greatest truck builder's latest and greatest truck! Here's the brand-new line of Chevrolet Advance-Design trucks for 1954!

You'll find they're packed with great new features . . . loaded with big new advantages that mean faster, more efficient service and lower operating costs on *your* job.

**NEW POWER
AND ECONOMY**

You get new high-compression power and greater operating economy with *three* advanced valve-in-head engines. Bigger, brawnier "Thriftmaster 235" engine. Rugged, durable "Loadmaster 235" engine. Mighty, all-new "Jobmaster 261" engine*—most powerful in Chevrolet truck history.

Most trustworthy trucks on any job!



ADVANCE-DESIGN TRUCKS

**NEW RUGGEDNESS
AND RELIABILITY**

Heavier axle shafts on 2-ton models. Bigger, more durable clutches on light- and heavy-duty models. Stronger, more rigid frames on *all* models. New pickup and stake bodies are built to stand the roughest going and to keep coming back for more—and they give you greater load space for '54!

**NEW COMFORT
AND CONVENIENCE**

New Comfortmaster cab provides increased visibility with new one-piece curved windshield. New Ride Control Seat* brings you extra driver comfort. New truck Hydra-Matic transmission* offers the last word in no-shift driving ease. Available not only on $\frac{1}{2}$ - and $\frac{3}{4}$ -ton Chevrolet trucks, but on 1-ton models, too!

Plan to see the completely new '54 Chevrolet trucks, and get the whole money-saving story at your Chevrolet dealer's now . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

*Optional at extra cost. Ride Control Seat is standard on C.O.E. models, available on all other cab models as extra equipment. Rear corner windows in standard cab, optional at extra cost.

MORE CHEVROLET TRUCKS IN USE THAN ANY OTHER MAKE

Only ADAMS Motor Graders give you all these features



● Never before have so many important work-producing, money-saving features been incorporated in one motor grader—and you get them all only in Adams improved heavy-duty models.

A typical owner comment comes from C. H. Lawson, president of C. H. Lawson, Inc., contractors of Williamsburg, Va., who says of his new 100 hp. Adams, pictured above, "This is the best motor grader I have

ever owned. I like its speed and traction, and it has plenty of power to handle a full blade. Also I like its ability to back up fast."

Ask your local Adams dealer to demonstrate one of these high-performing, cost-cutting motor graders—on one of your own jobs.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, IND.

*Make your next
motor grader an*





THE WISE CONTRACTOR is prepared for emergencies. The River Construction Company, laying pipe across the Trinity River, faced an emergency when a speeder LS 85 dragline slipped into 58 feet of water. This equipment was valuable and urgently needed on the job. The problem was to get it out and get it quickly. Let Mr. B. C. Hall, spread superintendent, tell how he rescued this heavy piece of machinery: "The only solution was to hook up two cables from two Carco winches and lift the speeder out. Those two Carco winches brought out that 44-ton dragline like it was a pail of water from a well. On construction work, the Carco winch can't be beat for long life, pulling power and all-around efficiency."

Rescue work is only one of the many uses of a Carco winch. You'll find them valuable, too, in pulling or lifting pipe, in towing heavy equipment, in loading or unloading cars, in a variety of jobs on pipeline and heavy construction work.

Remember, you can expect greater value from the leading producer, and get it from Carco, first in winch production. **PACIFIC CAR AND FOUNDRY COMPANY**, Renton, Washington. Branches at Portland, Oregon, and Franklin Park, Illinois.

**WINCHES FOR ALL
INDUSTRIAL TRACTORS**



JOB TALK . . . Continued from p. 6

Gradall equipped with a 36-in. bucket in the job complicated by cramped quarters and by criss-crossed buried piping installed in past years and not shown on any plan.

Good use was made of the Gradall's hydraulic controls to do close work without breaking pipes and disrupting processing operations. In many spots cramped quarters forced the operator to dig only 30 or 40 ft of trench. Then pipe was placed and the ditch backfilled so the excavator could travel over the backfilled area to continue digging.



Power Line Practice

That big Koehring crawler crane above has its boom too close to the power line behind it for comfort. But the 66,000-v line was de-energized daily while the Bethlehem Steel Co. was setting steel for this railroad overpass near Philadelphia to carry the eastern extension of the Pennsylvania Turnpike. In spite of all precautions, crane booms did touch the dead lines several times, proving again that it is far better to be safe than sorry.

Aluminum Air Line

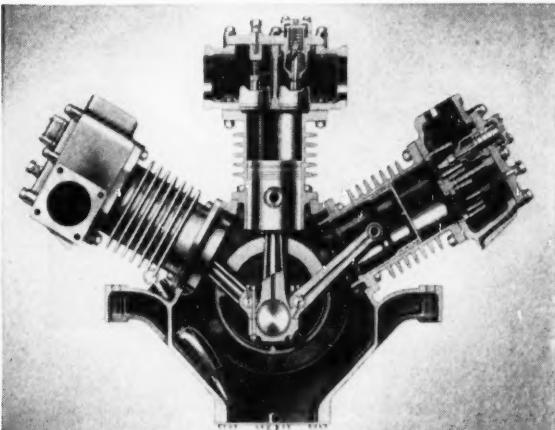
Lightweight aluminum piping serves as compressed air lines for Groves, Lundin & Cox, Inc., and S. J. Groves & Sons Co. on a stretch of the West Virginia Turnpike where large-scale drilling for blast holes is going on. Four-inch pipe with quick-acting aluminum cou-

(Continued on page 16)

If you believe

ALL COMPRESSORS ARE ALIKE . . .

| | | | | |
|-----|-----|------|------|------|
| 600 | 134 | 202 | 68 | 33.7 |
| 315 | 75 | 117 | 42 | 35.6 |
| 210 | 51 | 78.5 | 27.5 | 35 |
| 160 | 37 | 57 | 20 | 35 |
| 105 | 25 | 42.5 | 17.5 | 41.6 |



2 . EASY MAINTENANCE. All parts of the Blue Brutes are readily accessible. No special tools or complicated disassembly procedures are needed. And the compressor uses the same oil as the engine.

check these
three points

1 . RESERVE POWER. There's plenty of that built into every Blue Brute. That means it takes thousands of hours of normal operation before engine wear affects the compressor's output.

| | | | |
|------|--------------------|--------------|--------------|
| 60' | GASOLINE | 1.31 | 1.42 |
| 105' | GASOLINE DIESEL | 2.16 1.66 | 2.35 1.73 |
| 160' | GASOLINE DIESEL | 3.18 2.45 | 3.44 2.60 |
| 210' | GASOLINE DIESEL | 4.32 2.89 | 4.70 3.06 |
| 315' | GASOLINE DIESEL | 6.25 4.38 | 6.75 4.64 |
| 600' | DIESEL | 6.30 | 9.20 |

3 . FUEL ECONOMY. How does your compressor stack up in comparison with the Blue Brute for economical fuel consumption? The figures shown have been determined under normal field operating conditions.

Get all the facts about the Blue Brute from your nearest Worthington distributor. Or write to Worthington Corporation, Construction Equipment Division, Section H.3.6, Plainfield, New Jersey.

WORTHINGTON

IF IT'S A CONSTRUCTION JOB, IT'S A **BLUE BRUTE** JOB

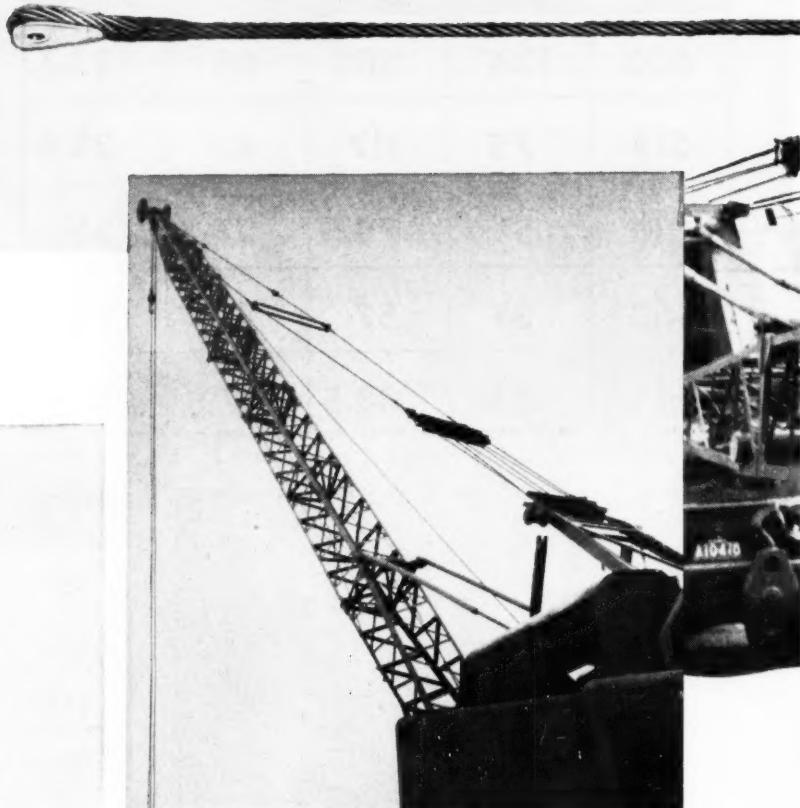


H.3.6

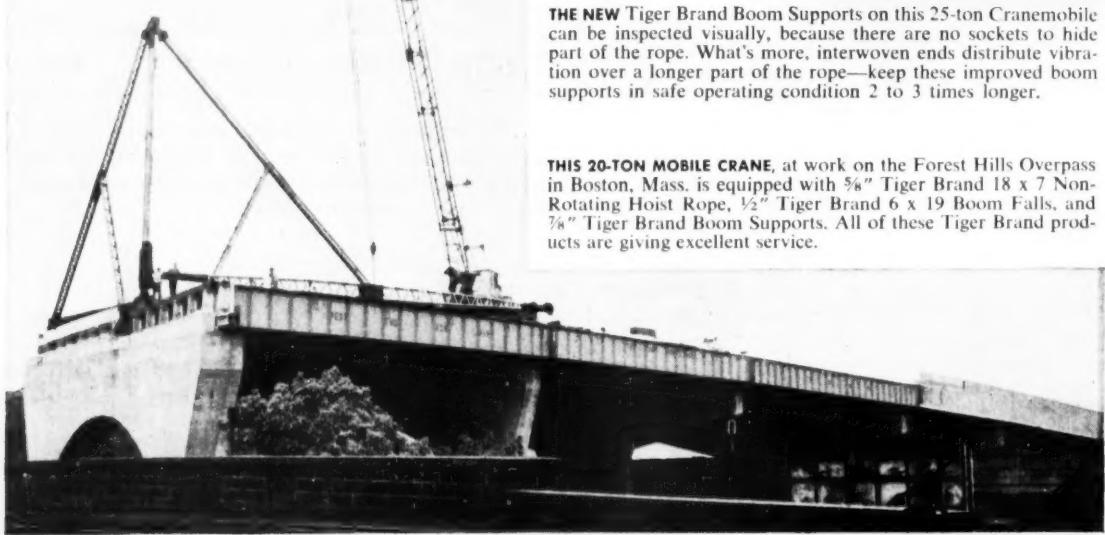
ROCK DRILLS * WAGON DRILLS * PAVERS * CONCRETE MIXERS * PORTABLE PUMPS

Crane rental company increases with these Improved Tiger Brand

The Right
Wire Rope
will do
the trick!



THE NEW Tiger Brand Boom Supports on this 25-ton Cranemobile can be inspected visually, because there are no sockets to hide part of the rope. What's more, interwoven ends distribute vibration over a longer part of the rope—keep these improved boom supports in safe operating condition 2 to 3 times longer.



THIS 20-TON MOBILE CRANE, at work on the Forest Hills Overpass in Boston, Mass. is equipped with $\frac{5}{8}$ " Tiger Brand 18 x 7 Non-Rotating Hoist Rope, $\frac{1}{2}$ " Tiger Brand 6 x 19 Boom Falls, and $\frac{7}{8}$ " Tiger Brand Boom Supports. All of these Tiger Brand products are giving excellent service.

safety Boom Supports



Last year, Lee Crane Service, Inc., Boston, Mass., added an extra measure of safety to every one of its 14 truck cranes. It removed apparently sound—but potentially dangerous—boom supports equipped with ordinary zinned sockets and installed new Tiger Brand Boom Supports.

Visual inspection now possible

Here are the reasons for this change, as told by Mr. Joseph Veanor, owner of Lee Crane Service: "Easy visual inspection is the reason we switched to Tiger Brand Pendants. With the old zinned-socket type, we could never be positive that a pendant was completely safe because the sockets hid part of the rope."

"These Tiger Brand Pendants completely eliminate the use of sockets. As a result, we can see and inspect every part of the rope. If any wires are broken, we can replace the pendant before a failure occurs. In that way, we can be sure that every one of our booms is completely safe."

Last 2 to 3 times longer

Tiger Brand Boom Supports last longer than the old-fashioned socket type, because each end of the wire rope is tightly and permanently interwoven. This

spreads strain and vibration over a much longer section of the rope, instead of concentrating all the strain right at the socket. As a result they last 2 to 3 times longer than other types.

Easily installed

Lee Crane Service had no trouble converting to these modern Tiger Brand Boom Supports. All fittings are standard size, so no alteration of equipment was required.

Send the coupon for more information on these improved boom supports. Or get in touch with our nearest sales office.

American Steel & Wire
Rockefeller Building
Cleveland 13, Ohio.

Please send my free copy of your descriptive folder on Tiger Brand Wire Rope Boom Support Assemblies.

Name.....

Company.....

Address.....

City..... State.....

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CLEVELAND, OHIO

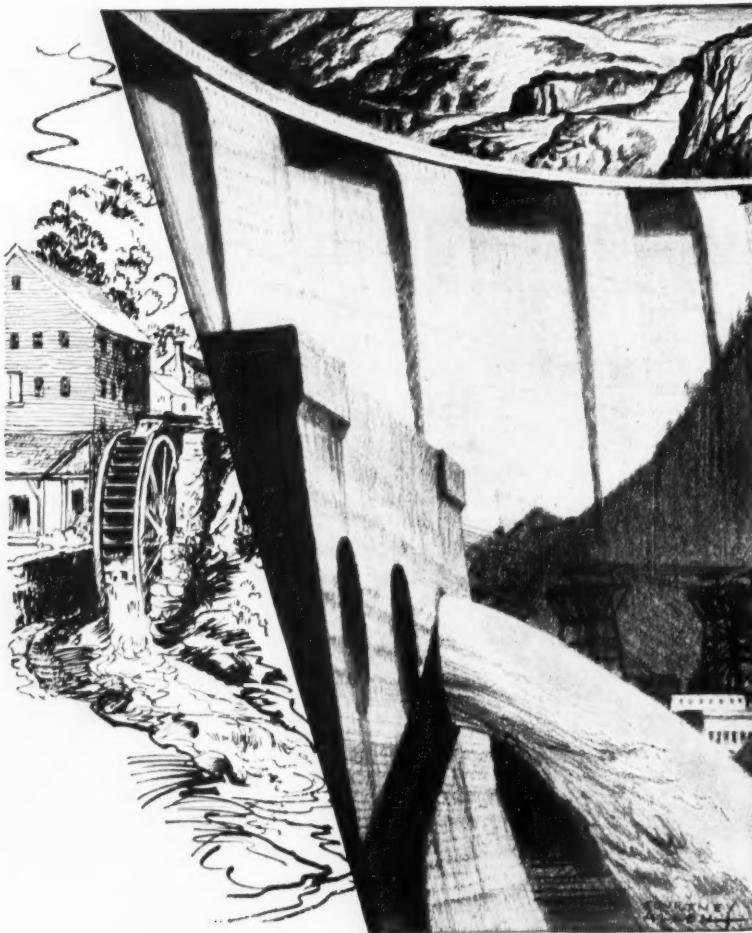
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed



UNITED STATES STEEL



More power by a dam site!

The early water-wheel converted a river's flow into mechanical power—usually enough for one small plant. Today, whole cities—even states—are supplied with *electric* power—and irrigating water, too—by gigantic dams, true monuments to the miraculous accomplishments of the modern construction industry.

Everywhere, members of that industry have found that the bonding facilities of the Aetna Casualty and Surety Company are unmatched—in scope of operations, in experience of personnel, in national reputation. You, too, will find that the Aetna is as dynamic and progressive as the industry it serves—its underwriting prompt, helpful, efficient. That is why so many contractors bond with Aetna—always.

No job too big--no job too small

AETNA CASUALTY AND SURETY COMPANY

AFFILIATED COMPANIES: AETNA LIFE INSURANCE COMPANY

AUTOMOBILE INSURANCE COMPANY • STANDARD FIRE INSURANCE COMPANY

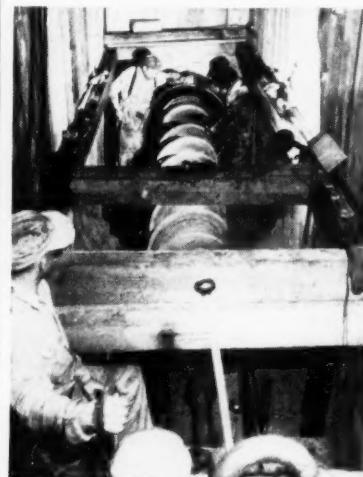
HARTFORD 15 CONNECTICUT



JOB TALK . . . Continued from p. 12

plings is used. It comes in 20-ft sections weighing 15 lb each and is laid easily over mountainous terrain by one or two men.

Three or four 600-cfm compressors feed the line which supplies up to six wagon drills at 120 psi. Groves, Lundin & Cox has about 1,800 ft of aluminum pipe in this service, with sections coupled by Wade couplers that are connected or disconnected in seconds by inserting or pulling a single pin. S. J. Groves & Sons Co. have about 2,000 ft of aluminum pipe for compressed air, use Morris sleeve-type couplings that tighten with several bolts. The pipe is manufactured by the Aluminum Company of America.



Auger Bores Under Street for Pipe

Pacific Gas & Electric Co. laid a 42-in. dia pipe under a busy San Francisco street recently without disrupting traffic. A suitable trench 20 ft deep was cut on each side of the street. Then a large auger was fitted into pipe sections to be installed under the street and rotated as pipe and auger were pushed against the face of the excavation.

The pipe advanced automatically as ground was removed, and the auger brought muck back into the open-cut section. When the auger hit rock, it was backed out and men entered the pipe to break up the rock. Sections of pipe were joined by welding on the inside.

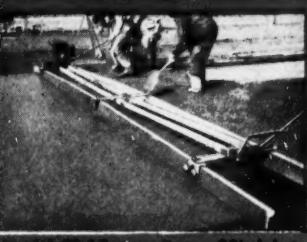
PG&E laid this large pipe to carry 12 separate cables from a power substation. Although this method of excavating was more expensive than the open-cut method, it did not interfere with heavy traffic.

GREATES

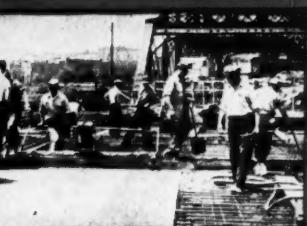
PORTABLE SCREEDING MACHINES EVER BUILT!

New *Whiteman* Models
offer many big improvements!

Model RS-11 with overhead screeding attachment, showing versatility of use.



Model RS-11 screeding a 20' slab to perfect level.



Whiteman Screeding Machine on
Highway Bridge Job, Bronx, New

NEW POWER!

Larger Wisconsin and B & S Engines.

NEW ADJUSTABLE FRAME.

Fits any width form.

NEW VERSATILITY.

Adaptable for overhead screeding.

NEW WEIGHT DISTRIBUTION.

Eliminates sag in screed sticks.

NOW!

Adaptable to Any Job!

Telescopic frame adjusts from
5' to 15' in width.

Never before has a screeding machine offered the superb performance, extreme versatility and rugged dependability of the new Whiteman Models RS-11 and 52-15. The perfect answer to screeding problems on slab floors, driveways, walks, narrow, winding roads, shoulders, bridges, approaches, tributary roads, limited and inaccessible areas. These machines puddle and vibrate the concrete throughout the entire depth and area,

thoroughly compact the slab, bring moisture to the surface and screed the slab to a perfect level preparatory to floating and finishing. Heavier aggregates do not settle to the bottom, but remain in suspension, resulting in a superior, far more durable slab. Results are equal to those of larger equipment. APPROVED BY MANY HIGHWAY ENGINEERS. Send coupon now for prices and literature.



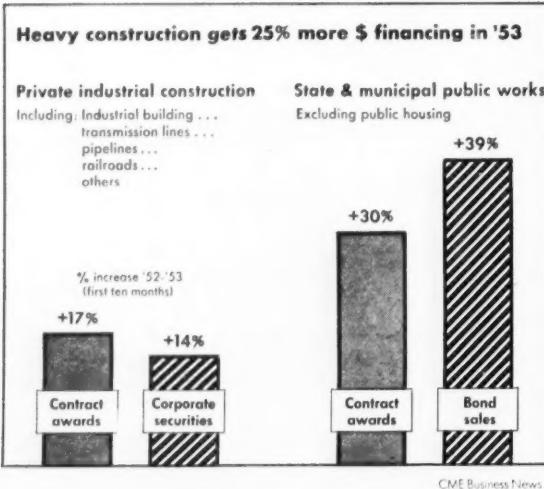
Whiteman

THE LEADER IN CONCRETE EQUIPMENT
POWER BUGGY • FLOATING & FINISHING MACHINES • SCREEDING MACHINES

WHITEMAN MFG. CO., DEPT. C
3249 Casitas Ave., Los Angeles 39, Calif.
Please send prices, literature and name of
distributor for Screeding Machines.
 Power Buggy Floating Finishing
Machines.

Name _____
Firm _____
Address _____
City _____ Zone _____ State _____

It's Your Business . . .



New money rolls in fast to finance new construction

STATE AND MUNICIPAL PUBLIC WORKS and heavy industrial construction have both come up with a record volume of financing in the first ten months of '53, although the cost of borrowing has also increased.

State and municipal bond sales so far in '53 total a record \$3.6 billion, up 39% over the '52 period. This compares with a 30% rise in construction contract awards (see chart). Public housing, not included in these figures, adds another \$262 million.

Schools have taken the lion's share of this new money with a total of \$1,214 million. Highways, including toll roads, have the next highest take with \$913 million. Among other types of local public works, bridges have required \$232 million; sewerage, \$379 million; waterworks, \$268 million; non-residential

building, \$258 million; earthwork and drainage, \$18 million; and unclassified, \$317 million.

Private industrial construction will be financed through corporate securities sales which top \$3.7 billion so far in '53 a 14% increase over '52. At the same time contract awards for heavy industrial construction are running 17% ahead of last year with new projects costing a total of nearly \$3.3 million. This includes new industrial plants, electric and gas utilities, pipelines, railroads and electric transmission lines.

Voters approve bonds for close to \$1 billion in public works

Future state and local public works construction received a big shot in the arm at the elections last month as the voters balloted on \$1,055 million in proposed bond issues.

Preliminary reports from the BOND BUYER covering \$860 million of the new issues show that the voters OK'd \$813 million, or 94%. If this percentage of approval holds for the \$195 million in bond issues not yet reported on, total approvals in the '53 election will run about \$990 million. This would compare with the \$1.2 billion approved in '52 and the record \$1.3 billion voted in '51 elections.

Ohio's \$500-million bond issue for a 20-year highway construction program topped the list of issues voted on at this election and pushed the total for highway bonds "voted in" to \$518 million. Next largest in total bond approvals reported so far were sewerage with \$87 million and schools with \$81 million.

Of course, these are only part of the total issues which have been voted upon during '53—many others having been passed at special elections throughout the year.

Higher steel and wage costs halt decline in highway bid prices

Highway contractors are still facing stiff competition, but higher steel prices and wage rates have forced them to stop cutting bid prices. In fact, prices on bid items heavily weighted with labor and steel costs rose in the third quarter.

This is shown by the Bureau of Public Roads Composite Mile Price Index which stabilized in the third quarter of '53 at 159.4, 0.6% above the second quarter value. This index is based on average prices in the 1925-29 period.

While common excavation prices continued to decline by dropping

6.2% in the third quarter, bids on structures and concrete pavement climbed, thus reversing their decline during the second quarter of the year.

Structures prices rose 4.4% to a new index of 247.6 in the third quarter. The big rise was in structural steel which climbed 8.8%. Structural concrete rose 4.6% and reinforcing steel was up 2.5%.

Concrete pavement prices showed a moderate 2.1% rise in the third quarter to a new index value of 171.8.

Despite higher bids in the third

quarter, structures prices are 3% below the all-time high in the third quarter '52, and pavement prices are 4% under the high reached in the fourth quarter '52. Common excavation prices are at the lowest level since 1950.

Average bid prices reported by the BPR for the third quarter of '53 are: common excavation, \$0.37 per cu yd; concrete pavement, \$2.22 per sq yd; reinforcing steel, \$0.052 per lb; structural steel, \$0.067 per lb; and structural concrete, \$22.15 per cu yd.

(Continued on page 22)

THIS SHOVEL KEEPS TRUCKS ON THE JUMP



The job shown here is an excavation for an addition to St. Benedict's Church, Irving Park and North Bell, Chicago, Ill. You'd call it a tough loading job anywhere you saw it. The material is concrete slab, brick, dirt and miscellaneous rubble from buildings that have been torn down. It's awkward stuff to handle. But Ray Trumbull, Chicago excavator, finds his Cat* No. 6 Shovel keeps five big trucks busy and loads out 800 cubic yards a day.

Mr. Trumbull also owns two Caterpillar HT4 Shovels. He reports: "Our Caterpillar machines stay on the job with low maintenance costs and make our operations very successful."

Watch a No. 6 Shovel at work. Watch it dig in and pick up a good two-yard bucket load. Then time its cycle as it swings to the truck, dumps and returns. You'll see why owners consistently get more

production than with other makes of equipment. Every part is built with extra strength, for hard work and long life. Controls are simple to operate.

Ask your Caterpillar Dealer for an on-the-job demonstration. Make him prove how these shovels can deliver more yardage, with less down time, at lower cost. Call him today!

Caterpillar Tractor Co., Peoria, Ill.

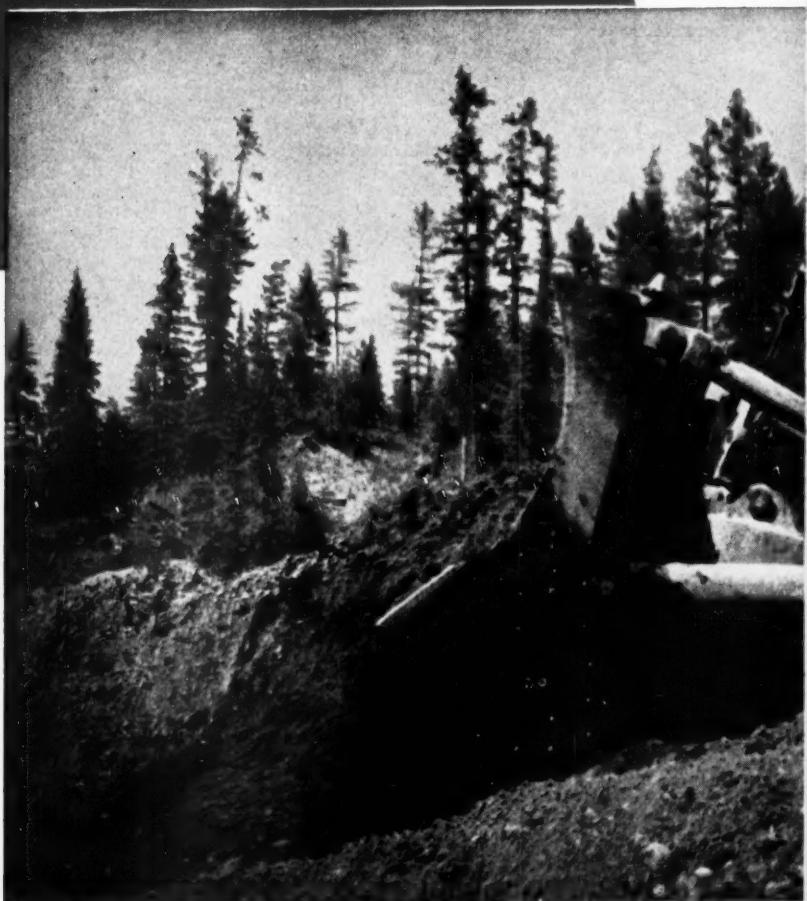
CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE

HOW TO GET MORE WORK FROM ENGINES

One of hundreds of pieces
of Texaco-lubricated equipment
used in the construction of
Hungry Horse Dam, Montana



TUNE IN:
METROPOLITAN OPERA
radio broadcasts
every Saturday afternoon.
See newspaper for
time and station.



TEXACO

SIMPLY keep your engines clean—free from power-stealing carbon and sludge—and they'll stay on the job and out of the repair shop. Lubricate with one of the famous *Texaco Ursa Oil* series—a complete line of lubricating oils for all heavy duty gasoline and Diesel engines.

Whatever the type, size or speed of your engines, whatever the fuel, there is a *Texaco Ursa Oil* exactly right to assure full-power performance . . . low maintenance costs and minimum fuel consumption. A Texaco Lubrication Engineer will gladly help you make the proper selection.

★ ★ ★

For chassis lubrication, *Texaco Marfak* assures longer lasting protection against wear and rust. It won't pound or squeeze out of bearings, it seals out

dirt and moisture.

For wheel bearings, *Texaco Marfak Heavy Duty* is the lubricant to use. It gives longer lasting protection against dirt and moisture . . . seals itself in, assuring safer braking. No seasonal change required. *More than 500 million pounds of Texaco Marfak have been sold!*

For transmissions and differentials, use *Texaco Universal Gear Lubricant EP*. You'll get smoother performance, add to gear life.

Let a Texaco Lubrication Engineer help you simplify and improve your lubrication procedures. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.



TEXACO SIMPLIFIED LUBRICATION PLAN

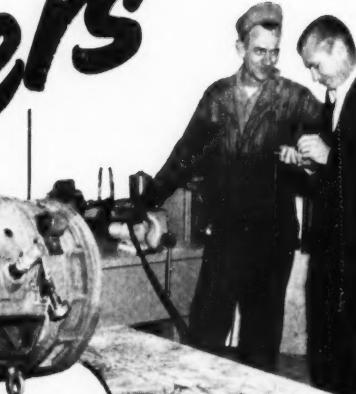
Specially developed for large construction jobs, the Texaco Simplified Lubrication Plan will handle all major lubrication with no more than six Texaco Lubricants. It's a great time and money saver. Eliminates costly lubrication mistakes. Get full details from your Texaco Lubrication Engineer.

Lubricants and Fuels FOR ALL CONTRACTORS' EQUIPMENT

"Engine Savers"

TWIN DISC MODEL CF TORQUE CONVERTER

"These Twin Disc Truck-Type Torque Converters are engine savers," says Bill Cross, garage foreman whose job it is to keep 30 Dart rear-dump 30-yard trucks moving millions of tons of overburden now... and copper ore later, at the huge open pit mine of the Anaconda Copper Mining



Company at Weed Heights, Nevada.

"When what they save in labor and parts on engines and driving units and brakes on one truck is multiplied by 30, like it is here, you've got a friend you don't want to part with," adds Cross.

Twin Disc Truck-Type Torque Converters save not only engines, but brakes, axles, transmissions, clutches — they keep engines operating in their most efficient range; start heavy loads smoothly; provide firmer traction; reduce shifting and pedal braking; prevent fatigue... promote operator efficiency.

Twin Disc Truck-Type Torque Converters are available for all heavy duty diesel truck engines, in two distinct types—Model CF for short, steep up-and-down runs, and Model DF with lock-out feature providing direct mechanical drive for long hauls with intermittent grades.



TWIN DISC

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin • HYDRAULIC DIVISION, Rockford, Illinois

BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • TULSA

IT'S YOUR BUSINESS . . .

Continued from page 18

Proposed work picks up fast in November

The outlook for another good year for contractors in '54 is strengthened this month as new proposed work increased sharply. New projects estimated to cost more than \$1.4 billion were reported in the first two weeks of November. This is more than the combined total of new work going into the backlog in the two months September and October, and should lift the November total of proposed work close to the '53 high of \$1.9 billion reported in January.

The upsurge in proposed projects this month follows a mild pickup in October to \$953 million from the \$444 million proposed during September—the lowest monthly total in the 1950-1953 period. (CM&E November, 1952, page 26).

Toll road and turnpike construction makes up the largest part of the new work proposed so far in November. In Michigan \$300 million in toll roads and bridges was announced by the state Turnpike Authority. This work includes a \$100 million toll road between Detroit and Bay City and a \$200 million toll road, including bridges, from Detroit to the Illinois state line. The Pennsylvania Turnpike Commission put a \$250 million turnpike extension into the works.

The other big project entered in the backlog this month was the \$315 million hydro-electric plant on the St. Lawrence, for the New York State Power Authority, which has cleared its legal hurdles.

SOME BIG CONTRACT AWARDS OF THE MONTH

Brown & Root, Inc., Box 3, Houston, Tex., natural gasoline plant, 3,571 bbl. gasoline and 41 tons sulphur daily capacity, at Tioga, N. D., for Signal Oil & Gas Co. and Amerada Petroleum Corp., Beacon Bldg., Tulsa, Okla., \$15,000,000.

Gust K. Newberg Construction Co., 2040 N. Ashland Ave., Chicago 14, Ill., general contract, second engine plant in Brook Park and stamping plant in Walton Hills, Cleveland, Ohio, for Ford Motor Co., 3000 Schaefer St., Dearborn, Mich., \$160,000,000.

(More Big Jobs on page 30)



2 Big Extra Values for you!

...in **JOY** *SILVER STREAK* ROCK DRILLS

1 EXCLUSIVE! CADMIUM PLATING
INSIDE and OUT

Cadmium plating prevents rusting of JOY Silver Streak Rock Drills and spare parts while in use or in storage. In addition, the plating forms cadmium oxide under frictional heat and pressure. This so effectively acts as a lubricant that the inner parts will not score, *even if regular lubrication is temporarily neglected!* In addition to assuring a smooth "run-in," cadmium plating allows closer tolerance of precision fitting parts—vital factors in the power and long life of the drill.

2 EXCLUSIVE! JOY DUAL VALVE
"Makes Air Do More Work"

The fast, powerful JOY Dual Valve action results in more and harder-hitting piston strokes per minute, for faster drilling with less air. The right amount of air is admitted behind the piston on the power stroke, and air is excluded ahead of the piston, to exert maximum force on the drill steel. Then the Dual Valve meters just enough air ahead of the piston to return it with a fast, snappy action for the next blow. The air actually does more work!

Consult a Joy Engineer



WAD C 4026

Over 100 Years of Engineering Leadership

JOY MANUFACTURING COMPANY

GENERAL OFFICES: HENRY W. OLIVER BUILDING • PITTSBURGH 22, PA.

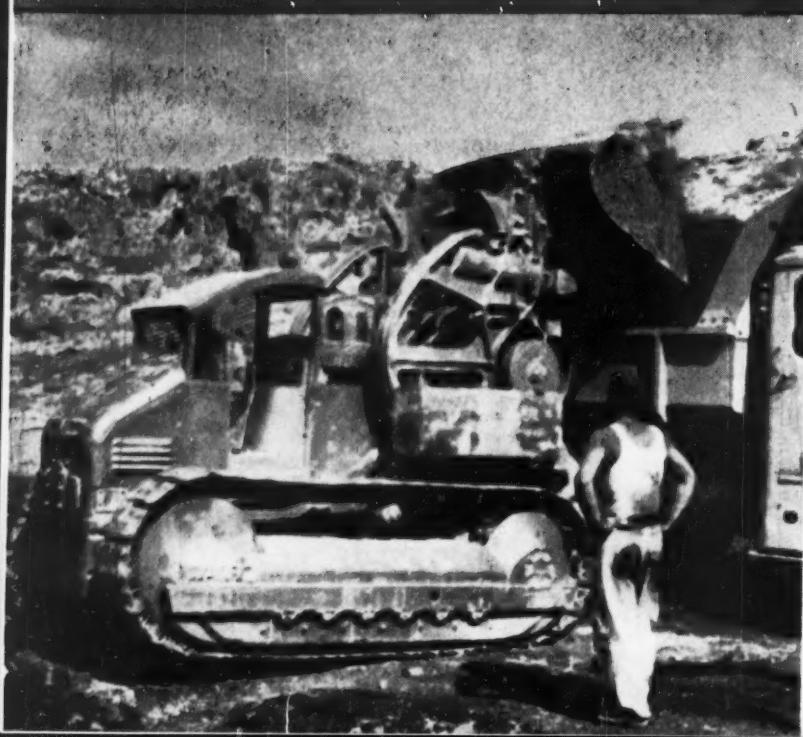
IN CANADA: JOY MANUFACTURING COMPANY (CANADA) LIMITED, GALT, ONTARIO

EIMCO

WORLD'S FINEST TRACTOR EXCAVATOR



The 105 at work excavating semiconcreted material. The machine shown here is on a contract job and is equipped with a 1½ cubic yard bucket equipped with long digging lip and teeth. The extra heavy design of this unit provides the necessary weight to use the machine for actual excavation work. Speed in loading is governed by the travel distance to the truck. With trucks in close the Eimco 105 can easily load at the rate of 6 to 8 yards per minute. Below—The operator sits up front in the 105 where he can get the best view of the work. Discharge of the bucket is controlled by the operator through the Shinto two speed bucket transmission.



Yes! The Eimco 105 is the world's finest tractor excavator! This is the first unit ever designed and built from the ground up with the purpose of performing as a base for heavy-duty attachments to its own frame so that it could be used efficiently for handling many jobs in addition to hauling around other equipment. The 105 is designed for heavy shock vertical loads as well as normal loads imposed through straight drawbar pull.

The Eimco 105 operates freely under all loading conditions, will dig, excavate or bulldoze on even or uneven ground because of its full oscillating track feature even with the bucket attachment.

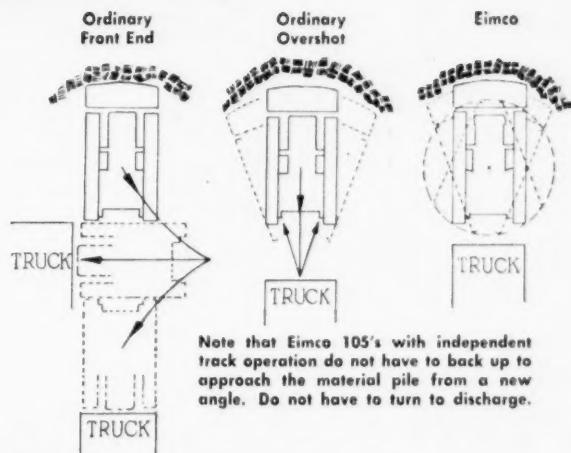
THE EIMCO 105 CONSTRUCTION ADVANTAGES

SAVES TIME: Simple, conveniently located handles held in one hand control all movements. Push for forward — pull for reverse — twist for spin turns. This easy control simplifies the operator's work — eliminates turning to dump — eliminates foot clutches and hand shifting and pull brakes — keeps the trucks up close and speeds up the loading cycle.

GREATER DEPENDABILITY: Simple, strong construction of the great new Eimco transmission provides greater dependability. This compact unit contains all of the gearing and clutches for speed changing and full independent reversal of each track. Every moving part is pressure lubricated. The oil-cooled, positive engagement clutches never need adjustment.

BETTER VISIBILITY: The operator in the Eimco 105 sits up front where he can see the work that's being done.

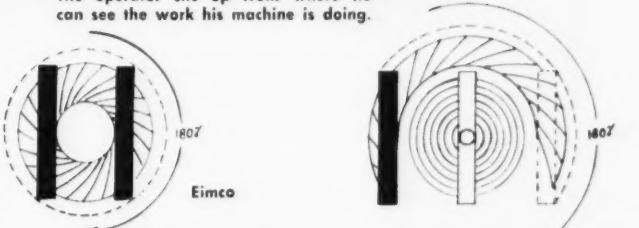
GREATER FLEXIBILITY: The 105 covers the upper bracket range of work done by several models of ordinary tractor equipment in several different price and weight brackets. With the 105 priced with the lower of this group, yet powerful enough to do many of the jobs for which the larger, more expensive, units are employed.



Note that Eimco 105's with independent track operation do not have to back up to approach the material pile from a new angle. Do not have to turn to discharge.



The operator sits up front where he can see the work his machine is doing.



Note: Eimco turns in its own length — makes "spin turns." Ordinary tractors lock one track and walk around.

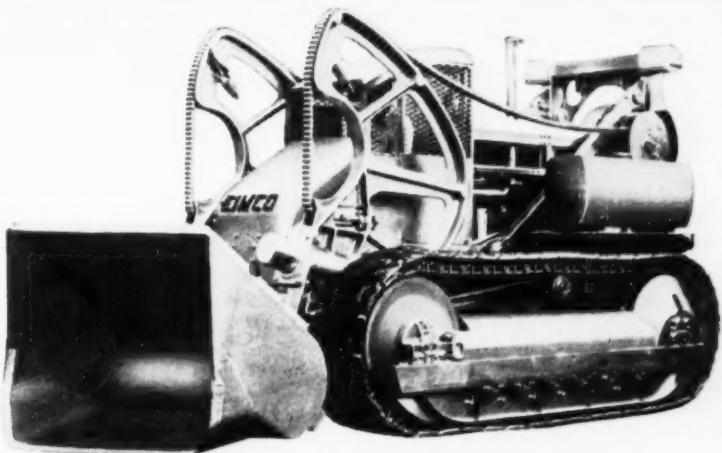


THE EIMCO CORPORATION

Salt Lake City, Utah, U.S.A.

Export Office: Eimco Bldg., 52 South St., New York City

STRONGER CONSTRUCTION THROUGH-OUT: The 105 is made of steel — not cast iron. There is quite a difference in these two construction materials. Cast alloy steel as used in the 105 is not subject to shock cracks even under severe operating conditions. Steel stands strains and stresses imposed by heavy loads without danger of failure. The Eimco 105 is the only crawler unit made of steel and gives you a superior machine with longer dependable life and lower maintenance costs. This is the machine for your next heavy job. Let us send an Eimco engineer to tell you the facts.



The Eimco 105 — world's finest tractor-excavator

KWIK-MIX
16-S DANDIE®

fits ALL your applications . . .



... handy for intermittent use

With 17.6 cu. ft. capacity and fast mixing cycles, Kwik-Mix 16-S Dandie is ideal as a small, low-cost central-mix plant for concrete bridge construction, abutments, culverts, footings, pilings. 16-S also gives handy, mobile mixer service for intermittent use on small quantity, 2-or-3-hour jobs. Versatile is the word for it! For instance . . . by interchanging axles on the square frame, you get either side or end discharge. Change over takes less

• • • • • • • • • • • • • • • • • • •
Mail to: Kwik-Mix Co., 3029 W. Concordia, Milwaukee 16, Wis.
Send us 12-page catalog on 16-S Dandie concrete mixer

NAME _____
COMPANY _____
STREET _____
CITY, STATE _____

CM

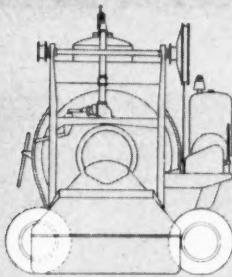
CKM336



KWIK-MIX COMPANY (Koehring Subsidiary)

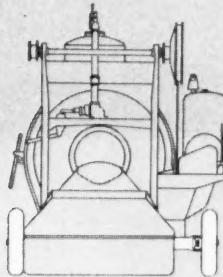
CONCRETE • PLASTER-MORTAR • BITUMINOUS MIXERS • MOTO-BUG®
(3½-16-S) (3, 6, 10-P) (10-14 cu. ft.) (power wheelbarrow)

BIG enough
for central mix
plant jobs

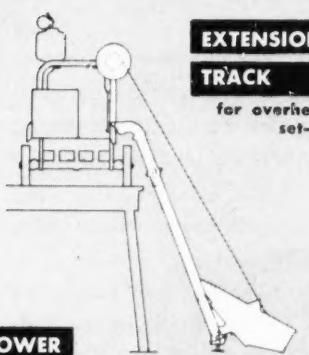


**INTERCHANGEABLE SIDE
OR END DISCHARGE**

readily adapts mixer to
suit operating conditions

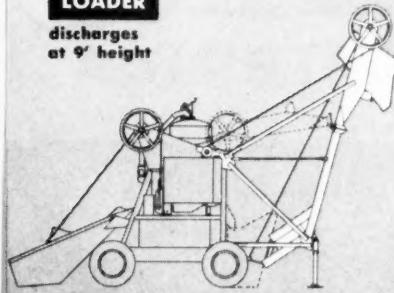


**EXTENSION
TRACK**
for overhead
set-up



**TOWER
LOADER**

discharges
at 9' height



**310 Trenchliner®
digs 17 feet deep**

With 45 digging feeds, this big-capacity 310 Trenchliner produces from 8" to 15½" of clean, smooth-walled trench per minute . . . digs 1½ to 4½" wide at 17' depth with single boom, and up to 6' wide at 12' depth with dual booms. 310 has full reverse of all operations for undercutting or making vertical set-ins . . . is equipped with easy-in, easy-out "Tap-In" teeth. Parsons line also includes 5 Trenchliners in smaller sizes.

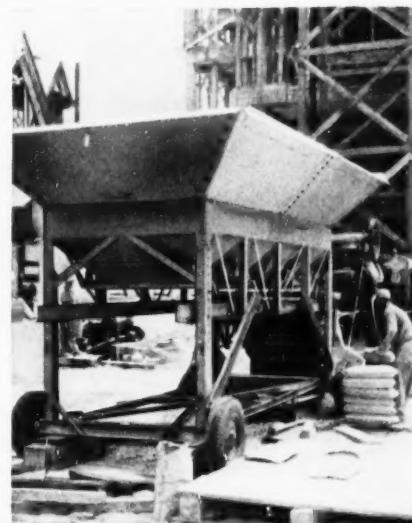
PARSONS • Newton, Iowa
(Koehring Subsidiary)



**Easy-charging
Lo-Bin® Batcher**

Lo-Bin Trolley Batcher holds 8, 20 or 30 tons . . . is only 7½" to 9½" high for charging with front-end tractor loader. Lo-Bin has 2, 3 or 4 compartments, up to 4 weigh beams, 22 or 44 cu. ft. weigh hopper . . . or can be arranged for 2 or 3 aggregates and 1 bulk cement compartment. Efficiently serves 28-S, 16-S, 11-S, 6-S mixers. Lo-Bin is quickly dismantled, easily moved by dump truck. Optional: wheels, tires, tow-bar.

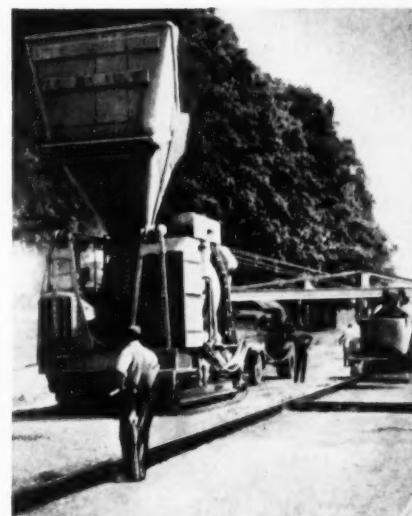
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(Koehring Subsidiary)



**86.7 batches per hour
with 34-E twinbatch®**

Koehring 34-E paver hits a top output of 86.7 batches per hour (60-second mixing time). This reserve work capacity offsets normal production delays . . . assures an average of 50 batches an hour, 8 hours a day, at no increase in batching, hauling or finishing equipment. Every mixing operation is automatic, accurate, fast with split-second Autocycle control. Get more facts on big Koehring 34-E twinbatch. Also check rubber-tired 16-E.

KOEHRING Company
Milwaukee 16, Wis.



with ACROW ADJUSTABLE STEEL SHORES, You...

GET 'EM



An Acrow Shore with hairline adjustment can be set in less than a minute—by one man! The all-steel construction of Acrow Shores gives you safer shoring, too, with guaranteed load capacity.

In stripping, Acrow Shores again save you money. They may be removed in seconds with the patented stud collar automatically cleaning the threads during stripping so your Acrow Shore is ready immediately for the next use.

Each Acrow Shore is a self-contained operating unit—no parts to get misplaced.

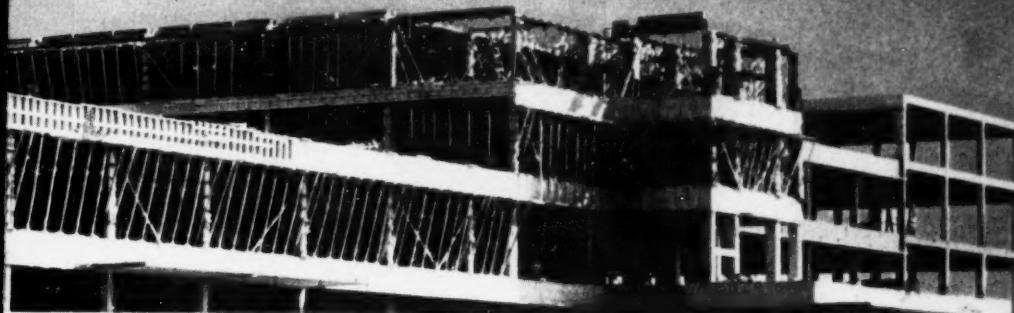
Available with standard head 6" x 6" beam-type 14" x 4", and J Head 14" x 4". Flat-type head fits any size stringer. Working ranges from 3'4" to 15'.

Save labor . . . save materials . . . speed work . . . use Acrow Shores for your next job.

ACROW

UP FAST

Memorial Hospital, Dallas, Texas, built by Robert E. McKee, General Contractor, Inc., at approximate cost of \$10,000,000. Mr. C. Brown, superintendent, used Acrow Shores on this project.



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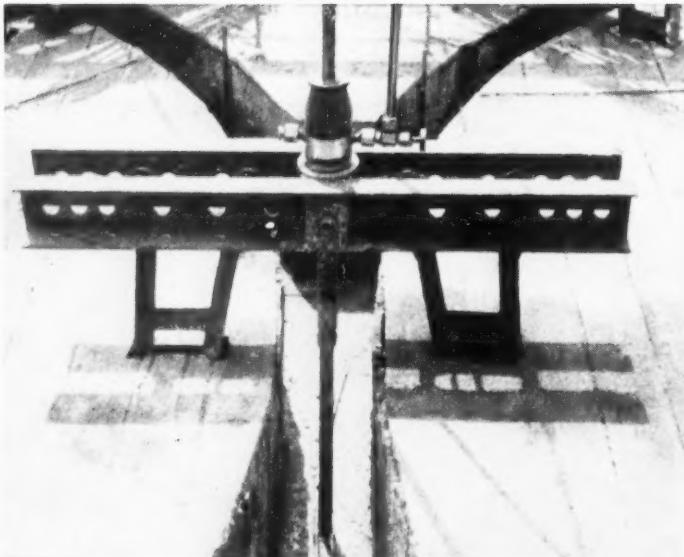
Acrow (Canada) Ltd., Montreal
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Acrow Argentina, S.A., Buenos Aires
Acrow Peru, S.A. (Ingenieros), Lima
Acrow (Engrs.) Ltd., London
Acrow Engrs. (Pty.) Ltd., Johannesburg
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ACROW

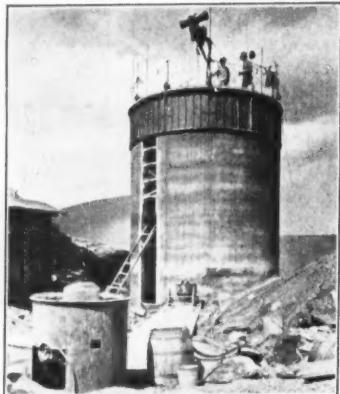
ADJUSTABLE STEEL SHORES

THE WORLD'S LARGEST SELLING SHORE

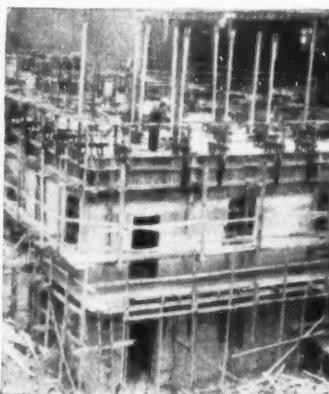
**SLIPFORM CONSTRUCTION
with
“CONCRETOR”
HYDRAULIC JACK**



**SYNCHRONIZED JACKING
CONTROLLED
CENTRALLY OR INDIVIDUALLY**



Silo in process of erection with typical "CONCRETOR" Slipform standard machine. Machines can be purchased or rented.



"CONCRETOR" equipment in use with wood forms. Rental plan available for all types of construction.

- 32-page catalog with 60 pictures available on request. Descriptions of various constructions in detail. Write us for your copy.

B. M. HEED, INC.
80 BROAD ST., NEW YORK 4, N. Y.



BIG JOBS OF THE MONTH . . .

Continued from page 22

Slattery Rock Corp., 46-30 54th Rd., Maspeth, N. Y., 1.29 mi Cross Bronx Expressway, White Plains Road, Zerega Ave., Bronx, for New York Bureau of Contracts & Accounts, The Governor Alfred E. Smith Bldg., Albany, N. Y., \$6,777,-652.

Mason & Hanger Co., Inc., Arthur A. Johnson Corp., MacLean Grove & Co., Grand Central Terminal, New York, N. Y., constructing river tunnel New Jersey rock tunnel and ventilation shaft for third tube of Lincoln Tunnel between New York and New Jersey for Port of New York Authority, 111 Eighth Ave., New York 11, N. Y., \$17,260,370.

Ebasco Services, Inc., Platte River Drive, Denver Colo., and 2 Rector St., N. Y., design and construct 96x220-ft. 110 ft. high brick, steel Arapahoe power plant addition in Denver for Public Service Co. of Colorado, 15th and Champa Sts., Denver, Colo., \$17,000,000.

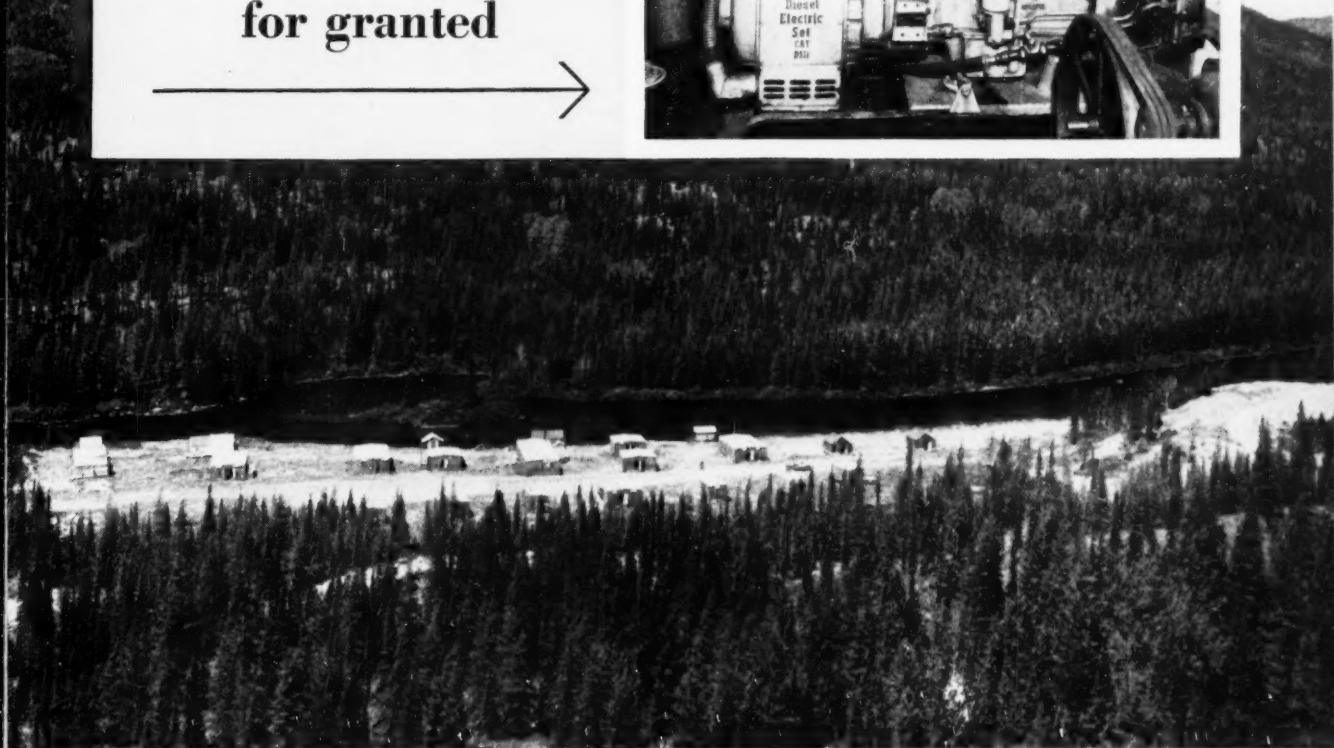
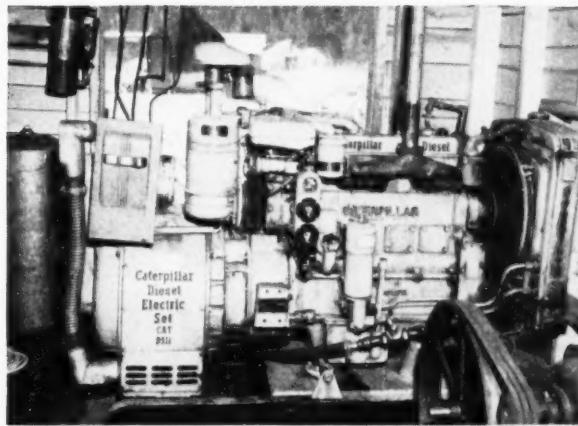
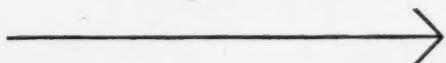
Chemical Construction Corp., 485 Madison Ave., New York, N. Y., titanium dioxide plant at Savannah, Ga. for the American Cyanamid Co., Calco Div., Bound Brook Road, Bound Brook, N. J., \$14,000,000.

Kansas City Bridge Co., 928 Broadway, Kansas City, Mo., steel, concrete bridge over Mississippi River from Green St., in Cahokia, Ill. to intersection of Chippewa and Marine Sts., in St. Louis, Mo., for the village of Cahokia, Village Hall, Ill., \$10,000,000.

T. L. James Co., Ruston, La., constructing 12.1 mi Sections 17, 18 and 19 of Ohio Turnpike in Cuyahoga County for Ohio Turnpike Commission, 139 E. Gay St., Columbus, Ohio, \$11,291,450.

Mt. Vernon Construction Corp., S. A. Healy Co., M. A. Gammino Construction Co., 439 N. Terrace Ave., Mt. Vernon, N. Y. 4.64 mi concrete, 2.56 mi unreinforced concrete, 0.23 mi bituminous concrete, 0.08 mi miscellaneous work and four highway separations for the New York State Thruway, Catskill section for New York Bureau of Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, N. Y., \$10,044,782.

Why this
remote camp takes
trouble-free power
for granted



Everything from food and clothing to lumber and Diesel fuel is flown into Camp 66. This is one of the line camps set up by C.M.M.K. to house workers on the 360-mile railroad construction job for Iron Ore Co. of Canada between Seven Islands, Quebec, and Knob Lake, Labrador. Power could be a problem here, but it isn't. A Cat* D311 Electric Set provides electricity for all lights and pumping the water supply.

There are many advantages in using Caterpillar Diesel Electric Sets in remote places. You can take their dependability for granted—it's engineered and built into every part for long life. They're rugged, too. They stand up under the buffeting of transportation. They're easy to install and operate. And they don't require costly, high-grade fuel. They burn low-cost No. 2 furnace oil without fouling. That means cheaper fuel and less of it to haul, as well as a minimum of maintenance!

Are you figuring on electric power? You can save yourself trouble and money with Caterpillar Electric Sets. Engines and electric sets are available in 12 sizes up to 500 HP and 315 KW. Your Caterpillar Dealer backs them up with fast service. Call him today—ask him to show you proof of dependable performance!

Caterpillar Tractor Co., Peoria, Illinois.

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**WE'VE MADE CLAIMS...
NOW MAKE US
PROVE THEM**



to you everywhere

a merry christmas

and a

happy new year



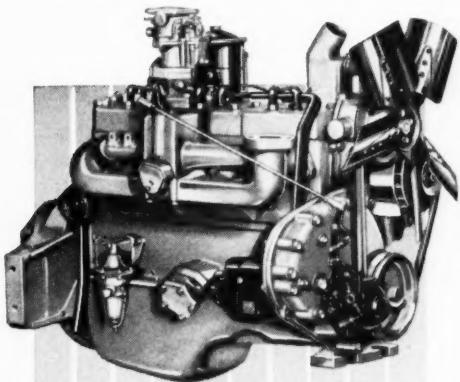
MARQUETTE CEMENT MFG., CO., Sales Offices: Chicago, St. Louis, Memphis, Jackson (Miss.)

MATERIAL HELP
IN
MATERIALS
HANDLING



Photo courtesy Mercury Manufacturing Company, Chicago, Illinois

***Pedigreed Power
moves the products
of industry . . .
faster and at less cost***



Every day is moving day in Industry. Raw materials, parts and finished products *must* move if supply is to meet demand. The system for moving materials in and around a modern industrial plant must be fast, economical and have the flexibility necessary to meet fast-changing requirements. Best solution is the modern tow tractor, small enough to scoot anywhere in the plant, powerful enough to pull loads heavier than itself.

Take the Mercury "Huskie" pictured here . . . it can pull a load of over 60 tons at a sustained speed of two and a quarter miles per hour. It can be equipped with snow plow, power-driven winch or sweeper-broom. Powering the "Huskie" is the six-cylinder, 251 cubic inch displacement Model 8 Chrysler Industrial Engine equipped with Chrysler four-speed

transmission and velocity governor. Small, compact, with an amazing power-to-weight ratio, this engine is ideal for equipment requiring a light-weight, powerful engine.

Any Chrysler Industrial Engine, open or enclosed power unit, can be supplied with gasoline, natural or LP gas-burning carburetor, standard or gear-driven front ends (magneto or hydraulic pump drive), mechanical or velocity governor, standard, gyrol Fluid Coupling or torque converter transmission.

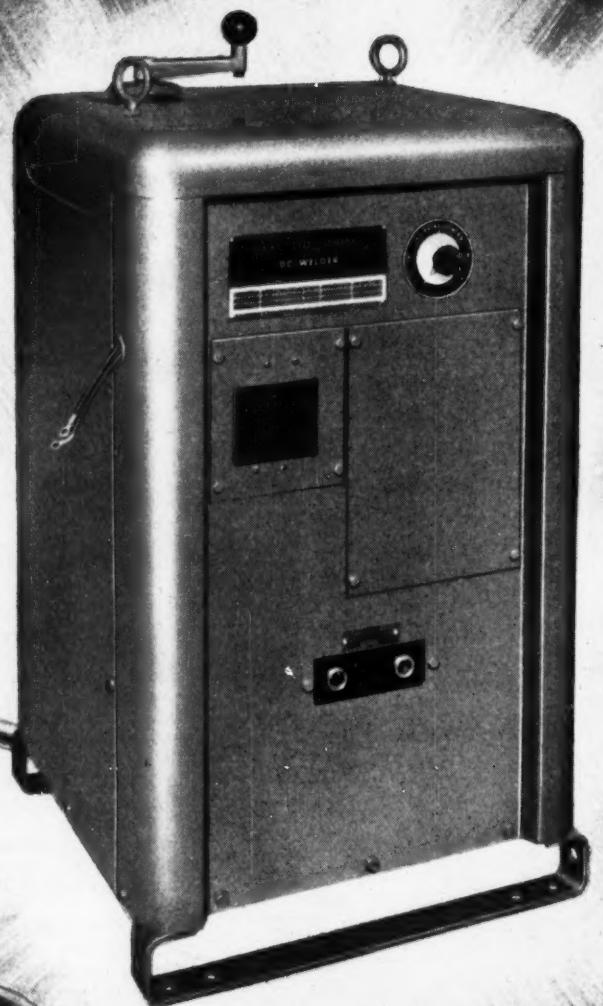
Remember, too, that Chrysler Power is not expensive. Production-line methods, adapted to specialized industrial engine building, provide a custom-built engine at mass-production prices. See a Chrysler Industrial Engine Dealer, or write: Dept. 912, Industrial Engine Division, Chrysler Corp., Trenton, Mich.

CHRYSLER
Industrial Engines

HORSEPOWER



WITH A PEDIGREE



New RA Welder means greater welding performance

Rectifier welder pioneered by Westinghouse
now provides many added advantages

Here is the *all-new* RA Welder, truly the finest, fastest and easiest, *any* position, d-c welding machine on the market. Westinghouse, the pioneer in rectifier type d-c welding equipment, has incorporated in the new welder all the engineering know-how and years of "on-the-job" welding performance needed to make the "RA" a *proved performer*. The exclusive features alone—Arc-Drive Control, Built-in Automatic Overload Protection, Single-Range Stepless Current Control—set new quality and performance standards for the welding industry.

Take the Arc-Drive Control for example: This exclusive Westinghouse feature provides an extra "push" to the metal as it leaves the electrode and moves toward the welding surface. This extra "push" assures greater weld penetration. In addition, the Arc-Drive Control enables the operator to quickly and easily adjust the arc-drive current to fit the needs of the particular job.

Another feature is the new "on-off" switch—the AB De-ion® Circuit Breaker. This circuit breaker provides positive and automatic protection against excessive overheating, yet permits harmless temporary overloads without interrupting production.

A rugged frame and a *Bonderized* sheet-steel case enclosure provide maximum protection for both indoor and outdoor operation.

Superior ventilation combines the use of natural air flow and a fan powered by a dependable, nonreversible, totally-enclosed, $\frac{1}{8}$ -hp motor with prelubricated ball bearings. Specially designed air ducts within

the unit provide for free and dependable passage of cooling air—this means longer life.

Features like these—the result of years of experience in producing rectifier welders—put the Westinghouse RA Welder ahead of other types of d-c welding equipment. Get all the reasons why the Westinghouse RA Welder is the best buy. Ask your Westinghouse representative for full details, or write Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pa.

COUNT ON THESE DEFINITE ADVANTAGES

- **ARC-DRIVE CONTROL** provides for greater weld penetration.
- **SINGLE-RANGE STEPLESS CURRENT CONTROL** allows infinite number of current settings with single-dial adjustment.
- **CIRCUIT BREAKER "ON-OFF" SWITCH** provides positive and automatic thermal overload protection.
- **SUPERIOR VENTILATION** affords greater natural cooling . . . longer winding life.
- **WEATHERIZED CONSTRUCTION** offers maximum indoor and outdoor weather protection against snow, rain, water and the most rugged of operating conditions.
- **QUIET OPERATION** means less operator fatigue and provides longer machine life through elimination of moving parts.

J-21835

YOU CAN BE SURE...IF IT'S
Westinghouse



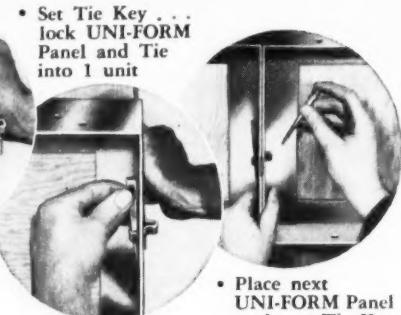
UNI-FORM Panels **SAVE TIME...**

CUT LABOR AND MATERIAL COST

SIMPLE ASSEMBLY

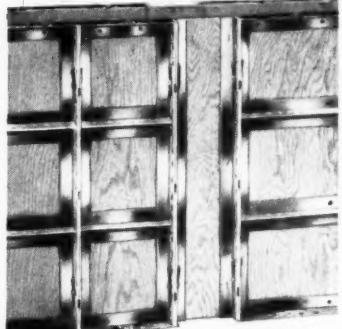


- Place Uni-Form Tie Loop into Tie Hole



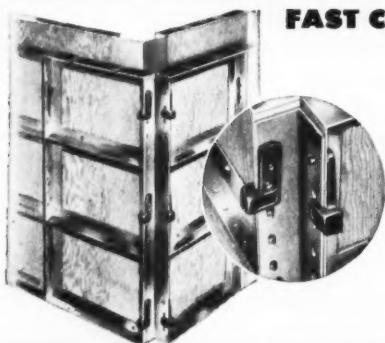
- Set Tie Key . . . lock UNI-FORM Panel and Tie into 1 unit
- Place next UNI-FORM Panel . . . insert Tie Key . . . assembly is complete!

EASY FORM CLOSURE

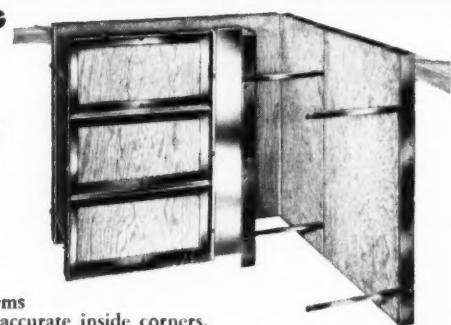


Close forms with 2 Uni-Form Angles and a piece of plywood . . . Start stripping here

FAST CORNER FORMING

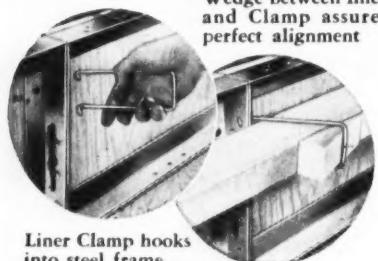


An Outside Corner Angle and Panel Loc Clamps form tight, accurate vertical corner . . . no additional tying.



Rigid Steel Corner forms provide quick...easy...accurate inside corners.

ONE SIDE ALIGNMENT AND BRACING

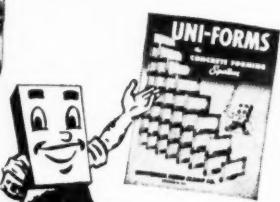


Liner Clamp hooks into steel frame . . .



Alignment and bracing on 1 SIDE ONLY
Saves Time . . .
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The second of two articles on profits

What Are PROFITS Used For?

This is the second article on the role of profits in our economy. The first was addressed to the question: "How High are Profits?" The answer was found to be: not high when compared with previous years and the present investment in corporate facilities. This second article is addressed to the equally important question: "What do corporations do with their profits?"

In 1953 corporations will earn about \$20 billion *after taxes*, if the recent rate of earnings is maintained throughout the year. These profits will be used (1) to expand and improve productive capacity through purchases of new plant and equipment, (2) to finance the operations involved in a growing volume of business and (3) to reward the people who have invested their money in American industry. Of the \$20 billion, the corporations will pay about \$9 billion to their stockholders as dividends. They will use the \$11 billion that remains to purchase new plant and equipment and to increase their working capital.

This year corporations are increasing their plant, equipment and working capital by a total of approximately \$32 billion. Of this amount, about \$26 billion is for new plant and equipment. The remainder is for working capital. As this

article will show in greater detail, about \$21 billion of this will come from depreciation allowances and sales of new securities. The other \$11 billion will come from retained profits.

It is impossible to trace exactly how each dollar of retained profits is spent. This money is mixed with other money that goes into the company treasury in the form of proceeds from loans, sale of securities and depreciation allowances. *However, it is a fact that by retaining \$11 billion of their profits this year, corporations have provided \$11 billion toward their total capital requirements, including the money needed for expanded and improved capital equipment.*

Profits Mean New Plants

This year American industry is engaged in a very large expansion of plant facilities. This will increase the industrial capacity of the nation by about 7 per cent. Since 1950, our capacity has been increased by about 12.5 per cent. And all of this expansion has been privately financed, even though about one-third of it was certified as necessary for national defense.

The expenditure during 1953 of \$26

(Continued on next page)

billion for new plant and equipment—an alltime record—imposes terrific financial responsibilities on our corporations. About one-half of the amount required will come from depreciation allowances. In general, these allowances are supposed to pay for the replacement of worn-out or obsolete equipment. Another \$8 billion will be raised by corporations through new security issues and long-term mortgage loans. All together, depreciation allowances, security issues and long-term loans will provide about \$21 billion. But this is still \$5 billion short of the \$26 billion needed for new plant and equipment this year. Thus, it is retained profits that spell the difference between expansion and standing still, between growth in the productive capacity of the economy and running downhill.

As plant facilities are expanded, corporations also need more working capital. A larger volume of business requires larger inventories, larger accounts receivable and larger amounts of ready cash to meet payrolls and bills for materials. The increase in these items during 1953 is estimated at \$8.5 billion, of which about \$2.5 billion will be supplied by short-term bank loans. The other \$6 billion will come from retained profits. Thus, retained profits provide an essential \$11 billion—\$6 billion for working capital, \$5 billion for new plant and equipment—to meet corporate financial requirements.

Incentive for Investment

The role of the profits that are paid to stockholders as dividends or to employees under profit-sharing plans is even more important than the role played by retained profits in providing plant, equip-

ment and working capital. Dividend payments provide the main incentive for investment in the stocks of corporations. They are the reward for risks taken by investors. Dividends paid by corporations whose common stocks are listed on the New York Stock Exchange provide an average return of about 6.5% at present prices, and dividends on preferred stocks average about 4.5% return. Dividends are distributed among 6.5 million stockholders. Also, it is estimated that 3 million employees now are covered by profit-sharing plans. These plans increase the incentives of both production workers and managers to work harder and more efficiently.

Thus, more than 9 million Americans have a *direct* financial stake in corporate profits through ownership of stock or participation in profit-sharing plans. But all Americans share indirectly in the rewards of a successful business year. Investment of a major part of 1953 profits in new plants and equipment means more employment opportunities and better working conditions for labor. For the nation, it means new industrial capacity that is essential both for national defense and to produce more and better goods for a rising standard of living.

Corporate profits after taxes represent about 6% of the nation's total income. But the job they do to stimulate investment and to finance industrial expansion and improvement is more far-reaching and more essential to the prosperity and well-being of the American people than would be suggested by that small figure.

McGraw-Hill Publishing Company, Inc.

Gradall—money-maker for contractors large and small!



A tight spot—a Gradall job! With its telescoping arm-action the Gradall works easily under the low roof of this building.



**Gradall
makes money
for you
on all these jobs and many more**

- Trenching and back-filling
- Excavating
- Placing tanks, culverts, curbs, etc.
- Sloping and grading
- Ditch digging and cleaning
- Ripping and loading old pavement
- Hand finishing and clean-up

Large contracting firms, who can buy many different machines for big contracts, have proved the Gradall pays off on major projects. Gradalls do jobs no other machine can handle, and "hand-finish" work formerly confined to hand labor. And they quickly find that a Gradall is no "specialist"! It invariably becomes a *permanent* part of their equipment, because it's *always busy*. It handles many "short run" jobs—eliminates the need for specialized (and often idle) machines—cuts the time and cost of cleaning up contracts with hand labor.

Smaller contractors, who must operate with one or two machines, go into business on a "bigger" scale with a Gradall. With this multi-purpose machine they bid on *more* jobs—and more *complex* jobs—get jobs no other machine can touch. When work calls for accuracy it goes to the Gradall contractor because he doesn't have to depend on costly hand labor to get that accuracy. And Gradall works *fast*, so it's soon ready to speed to the *next* job. Gradall provides the very maximum of on-the-job time and profits!

Whether you're "big" or "small" in terms of the contracting business, it will pay you to arrange a field demonstration with your Gradall Distributor. He'll show you how a Gradall will *make money* for you!

Gradall Distributors in over 75 principal cities in the United States and Canada

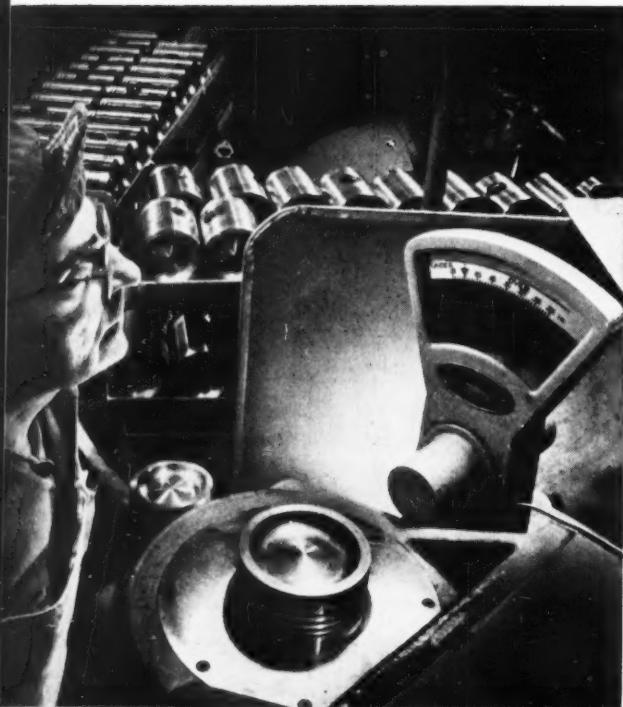
Gradall
DIVISION OF 



Continuous Research by GM engineers aims at refinements and improvements in every component of GM Diesel engines. Here you're looking through the windows of a durability testing room where newly

designed parts and new materials, as well as production engines, are subjected to overload conditions to determine their life and efficiency.

BUILT FOR KEEPS... and here's how we prove it!



General Motors Diesel engines go into more than 750 different models of construction, mining, drilling, farming and lumbering equipment, work and pleasure boats and scores of other applications.

Engines leaving our factory may be called upon for heavy-duty service in trucks, tractors or drilling rigs. They may propel a yacht or power a stand-by generator. But regardless of the application, *all* GM Diesel engines are designed and built to stand up under the most rigorous operation in round-the-clock service, week in and week out, year after year.

Here you see a few of the steps we take to insure top quality and peak performance in every engine we build—inside reasons why GM Diesels cost less to operate and maintain.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN

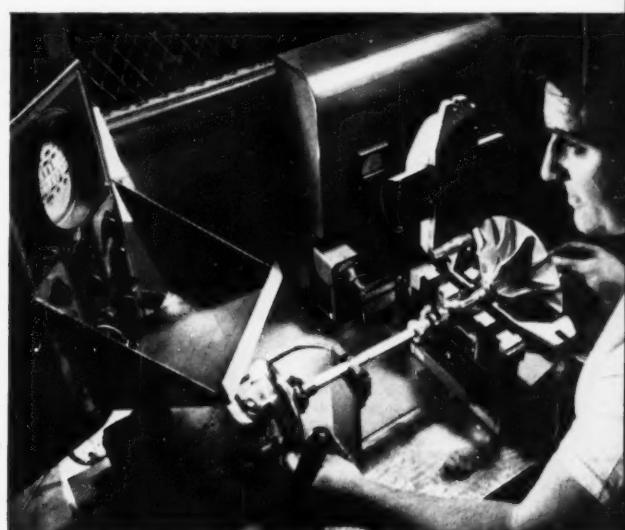
Piston Weight Check—All pistons, whether for new engine production or for service parts stocks, are held within rigid weight limits. This machine not only weighs the piston but automatically machines off any excess weight. You're sure of a perfect fit and good performance when you buy *genuine* GM Diesel parts.



Surface Plate Inspection using a vernier height gauge and dial indicator to sample check location of counterbores which hold oil- and water-passage seals. This new head-to-block sealing method developed by Detroit Diesel is unique in the industry and has proved far superior to the over-all laminated gasket commonly used.



Cylinder Bore Inspection—This unique air-operated precision gauge checks the diameter and roundness of the cylinder bore at four different points simultaneously. Tolerances are held to .001" to assure a perfect fit for the replaceable cylinder liners.¹



Balancing Blower Impeller for a GM 6-110 Diesel engine, using a balancing machine developed by General Motors Research. Unit employs a cathode-ray oscilloscope. Blower scavenging makes the GM Diesel engine cleaner burning and gives it better high-altitude performance.

It pays to STANDARDIZE on

Single Engines . . . 16 to 275 H.P. • Multiple Units . . . Up to 840 H.P.



Injector Testing—Every injector used in GM Diesel engines is run for one hour at full engine speed and then calibrated to assure the proper amount of fuel at each stroke. GM's unit injectors eliminate the need for high pressure fuel lines and bulky central metering pumps.

**PICTURE
OF THE
MONTH**
CONSTRUCTION
METHODS AND EQUIPMENT



Two Digging for Two Barrels

It's two-by-two all the way on the west side of Chicago as Healy Bros. & Co. of McCook, Ill., put in the 6,000-ft Wrightwood Avenue double-barreled concrete sewer. The excavation is approximately 20 ft deep and 30 ft wide. Trench bracing is done through a frame of 12x12-in. steel H-beams with built-in house jacks on one end pushing against wood plank sheeting set in as excavation progresses. Sewer barrels are semi-elliptical, measure 13x10 ft and are 4 3/4 in. thick. Pipelaying follows close on the heels of excavation by these two 2 1/2-yd Northwest pullshovels loading into two trucks, only 400 or 500 ft of trench being left open at one time. Excavated material is hauled away by a fleet of eighteen 10-yd trucks with 70% hauled 6 mi through city traffic to the lakefront and the balance going over the newly laid concrete pipes as backfill.

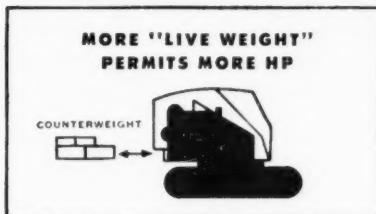
Before you buy:

COMPARE NET HP!



This LS-85, despite tough, big-chunk rock, has been operating over 1200 hours without requiring one replacement part!

**Don't judge available power by engine model only
... NET hp is what adds up to extra profit!**



COMPARE shovel-cranes with and without counterweight. That test spotlights the size, weight and heft built into the working parts and structural members. You'll find the LS-85 has more "live weight" than comparable $\frac{3}{4}$ -yard shovel-cranes.

Greater net horsepower assures faster, deeper digging. Bigger loads are handled without stalling. For example: the diesel driven heavy-duty $\frac{3}{4}$ -yard LS-85 packs 92 net hp. That's more power than comparably-sized competitive rigs can safely use. It's why the LS-85 has more digging force behind its bucket teeth . . . why it cuts so smoothly . . . hoists and swings without a pause.

Use of greater net hp is practical because of all-welded, stress-relieved construction and extra "live weight." This extra live weight is in heavier, sturdier working parts and structural members—rather than a heavier counterweight. All this means year-after-year service and low maintenance costs. So whatever you do, don't compare power by the engine model only—CHECK NET HP.

For more facts on the LS-85, ask your distributor, or write for Catalog 2317. For the complete line, request Catalog 2373.

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BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND
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DISTRIBUTOR SALES
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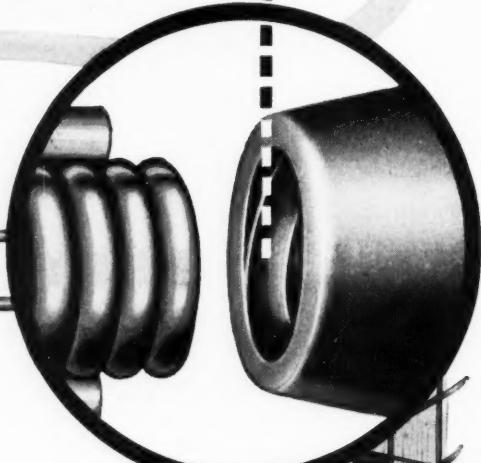
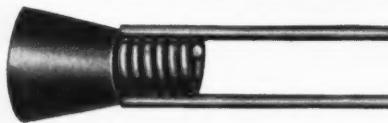
NEW!

THREADED CONES *

for SUPERIOR
CONE-FAST COIL TIES

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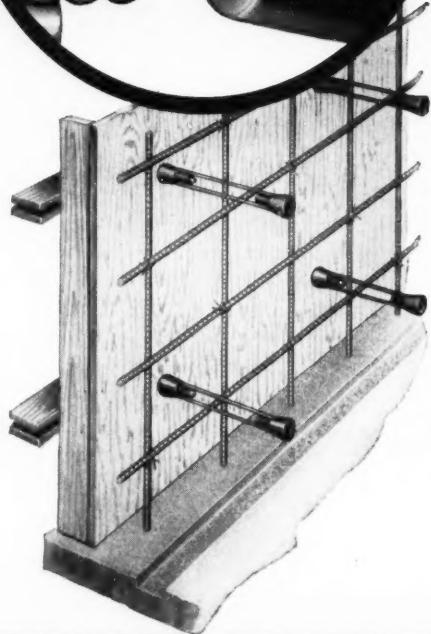
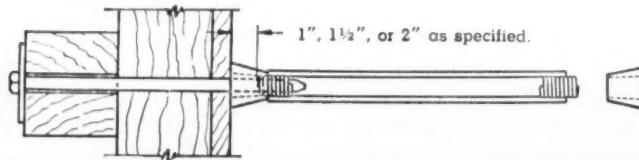
**Cuts Form Costs by Permitting
Extra Fast Erection of Panels**



A direct way to cut forming costs is to use new Superior *Threaded* Coil Cones with Cone-Fast Coil Ties. Where cones have to be dependably held in place, *Threaded* Coil Cones are practically a "must".

Previously, Coil Cones were held onto the extended coils by friction alone. Now, a couple of threads in the cone fix Coil Cones securely to the Coil Ties. Here's another advantage . . . units can be bench assembled with the assurance that they will arrive at the installation point intact! *Threaded* Coil Cones cannot be knocked off the Coil Ties when the opposing form is being applied. When unscrewed with a cone wrench, the threaded Coil Cones automatically back themselves out of the wall.

Cone-Fast Coil Ties with threaded Coil Cones are supplied for $1/2$ " to $1\frac{1}{4}$ " Coil Bolts, with safe load capacities from 5,000 lbs. to 36,000 lbs. Working parts (cones and bolts) are returnable for credit.



SUPERIOR CONCRETE ACCESSORIES, INC.

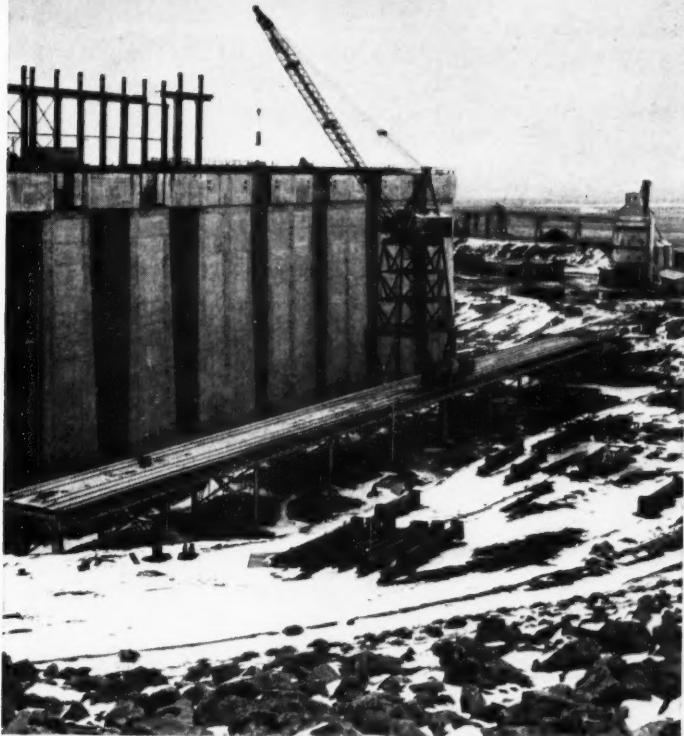
4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office
1775 Broadway, New York 19, N. Y.

Pacific Coast Plant
2100 Williams St., San Leandro, Calif.



ENGINEERING REPORTS:



ELECTRICAL CO-ORDINATION provides continuous operation of this revolver crane 100 feet above the base of the huge intake structure. Movement along trestle is powered by a G-E 200-hp Type MR motor at foot of the gantry.

Electricity helps Garrison Dam keep round-the-clock schedule

G-E drives, still on the job after six years, are helping to harness Missouri River

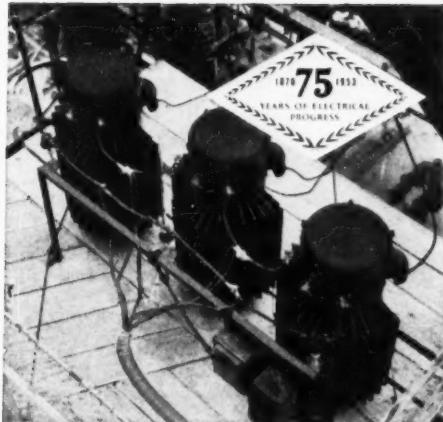
At Garrison Dam near Bismarck, N. D., completely electrified equipment plays a vital role in keeping round-the-clock construction work on schedule. All electrical systems for the project's main stages were designed and co-ordinated by U. S. engineers, Peter Kiewit and Son Co., and Morrison-Knudsen Co. contractors—aided by G-E application engineering. This engineering teamwork resulted in maximum working capacity and fast, smooth operation.

Let G-E application engineers help *you* get the most from your construction equipment through electrification—from the smallest drive to the largest power distribution system. Contact your nearest G-E Apparatus Sales Office. General Electric Co., Schenectady 5, New York.

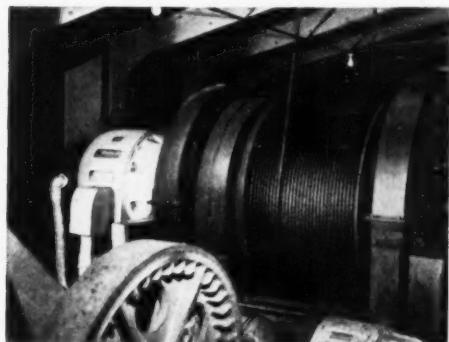
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Engineered Electrical Systems for Heavy Construction

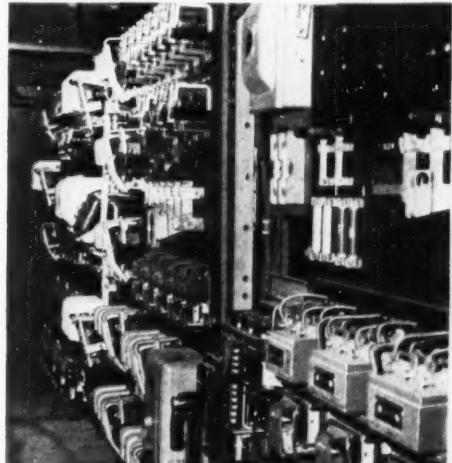
GENERAL ELECTRIC



ADEQUATE POWER to maintain smooth, dependable crane performance is stepped down by these portable G-E transformers.

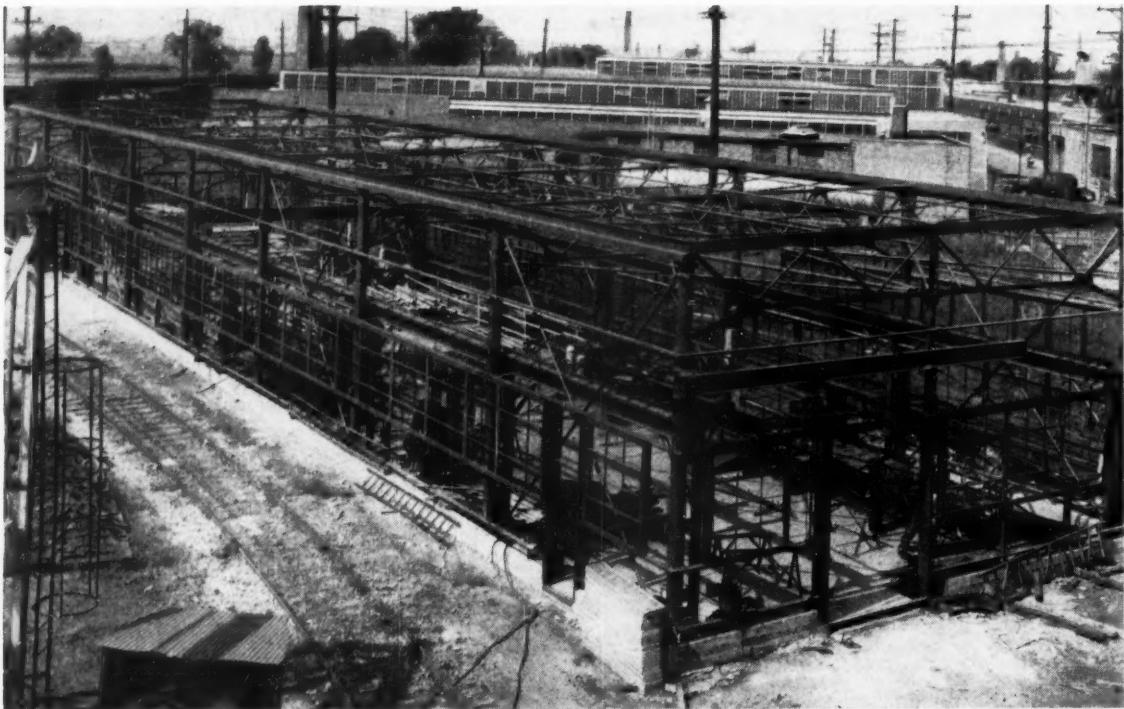


RELIABLE DRIVES must stand exacting demands of this revolver crane. G-E 200-hp motors and control are key to this application.



CENTRALIZED CONTROL equipment on this compact G-E panel is mounted in the cab for simple one-man operation.

Construction News in Pictures...

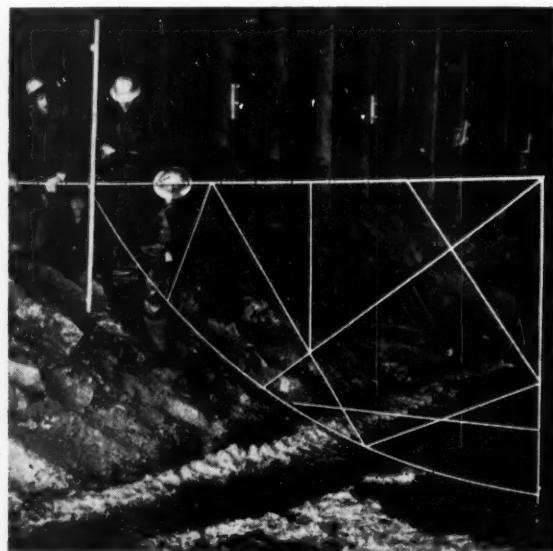


USING PIPE 'TWAS A CINCH—L. B. Foster Company, Chicago, Ill., structural pipe distributor, planned to use structural shapes in constructing its new building, but when they learned material was not available they re-designed the building to use material they had plenty of—structural pipe. Standard 1½- to

9-in. steel pipe was substituted for all columns, trusses, joists and bracing. The building was erected in four weeks. No special fittings or attachments were necessary in the erection of the steel frame. Field erection bolts were used so it could be disassembled and re-erected in another location.



END OF THE ROAD—Usually heavy road machinery is used to build a bridge and approaches, but this one was just about destroyed with a trailer loaded with such equipment. The main span of the North River bridge, near Tuscaloosa, Ala., dropped 50 ft into the water when the trailer snapped loose from the truck cab. E. J. McGough of Birmingham, driver of the truck, commented, "It happened so fast I didn't have time to get scared."



SIMPLE TEMPLET—A time-saving templet made of ½-in. thin-walled, cross-braced conduit pipe, is being used in the power and outlet tunnels recently excavated for Palisades Dam in eastern Idaho to find high spots of rocks and overbreak or surplus excavation. The templet is rigid, but still light enough for two men to handle. The 26-ft dia tunnels, lengths of 1,200 and 1,500 ft, will divert flows of the Snake river through the dam's left abutment.

WHITE 3000 Fleet Speeds Spreading...Cuts Hauling Costs



REPORT FROM SPOKANE—Lower hauling costs, faster work with the White 3000!

And it's the same story from coast to coast!

Tailored right to the job, the White 3000 design adds new efficiency and economy throughout the construction industry... like this fleet of White 3026's owned by Curtis Gravel Co., Spokane, hauling and spreading materials for highway surfacing.

Find out how many ways White Trucks can cut *your* costs... speed *your* work. See your White Representative today.

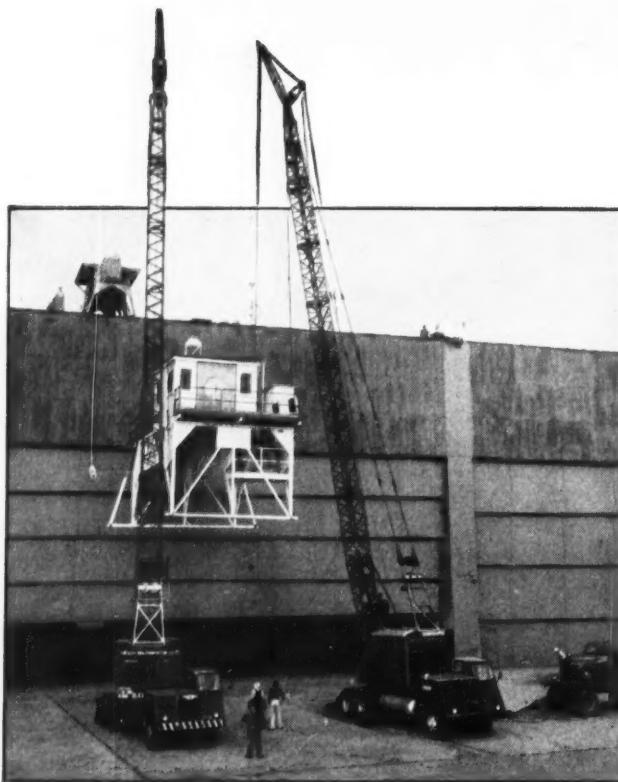
30 MINUTES FOR 13-MILE, 13-TON LOAD

Curtis Gravel Co. boosted payload within legal limits from 10 to 13 tons when this fleet of Whites went into service. These bottom dump spreaders are on continuous service from loading at the hopper to spreading station—30 minutes a round trip. High maneuverability and plenty of Mustang power save time on tight schedules.



THE WHITE MOTOR COMPANY • Cleveland 1, Ohio

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All lifts are easier with a **CRANE MOBILE**

... on **TWIN** lifts
for instance



There's only one way you can beat the performance of a BAY CITY CraneMobile on high lifts or heavy lifts and that's with a pair of CraneMobiles. Here, one team of CraneMobiles is handling a twin lift on a 7-ton antenna tower atop a 60-ft. hangar at Long Beach, California. And another pair of CraneMobiles is skidding wood floats into the Mississippi River at the Minneapolis Yacht Club. That's typical of the way these powerful, efficient, versatile cranes make all lifts easier and every job faster. Both crane and carrier are engineered and built as a unit by BAY CITY to give you a balanced machine with a low center of gravity. CraneMobiles are available in capacities up to 25 tons . . . a selection of carriers to suit job requirements.

Compare these advantages . . . a few of many.

- Collapsible high-gantry permits raising maximum recommended boom lengths from horizontal without outside assistance.
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- Power load lowering device may be quickly engaged or disengaged to lower heavy loads smoothly and with precision.

Your BAY CITY dealer can give you complete information about CraneMobile. See him today. BAY CITY SHOVELS, INC., Bay City, Michigan.

Handy pocket-sized booklet of facts and features tells why "all lifts are easier with a CraneMobile". It's loaded with interesting information, it's nicely illustrated and it's yours for the asking. Just write us.



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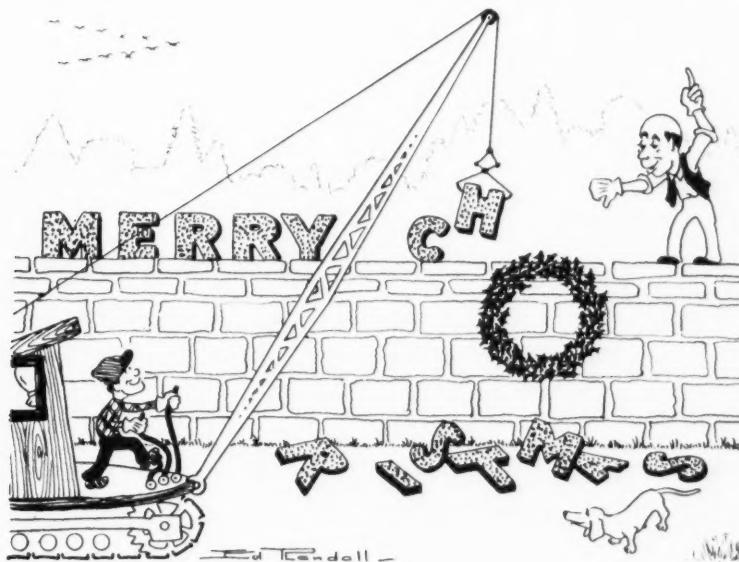


Volume 35
Number 12

CONSTRUCTION METHODS AND EQUIPMENT

DECEMBER
1953

Harold W. Richardson, Editor



Merry Christmas

FAR BETTER than we can do it with words, our old pal Spike Hennessey is building up our Yuletide wishes for you in crane-placed blocks on top of a wall of Good Will.

But we'll back Spike's message up with the prayer that each and every one of you be blessed with the Joyous Spirit of Christmas, and that this troubled, suspicious world be calmed with Peace on Earth to Men of Good Will.

Contractors Favor One Construction Union

MANY CONTRACTORS throughout the country agree with our contention expressed in this page in the August and September issues that the present craft union system of organized labor fails to meet the needs of today's complex construction procedure, and should give way to one united construction union. That is the overwhelming opinion expressed in comments received following publication of the two-part editorial. Remember, we advocated one single union divided only into three classes of ability—unskilled, semi-skilled and skilled. Members of each class would receive the same pay under similar working conditions, work-week, pension and welfare systems regardless of type of employment.

Labor leaders have kept their reaction to the proposal to themselves, though we pointed out its benefits both to union management and union membership. But favorable comments have poured in from contractors, associations, and the daily and business press. The Milwaukee (Wis.) Journal reprinted our editorials, then commented in an editorial of their own that the idea "is quite a startling thought . . . all this may seem like pretty dreamy stuff. But dreams are the stuff of which progress is made. At least they can jar one's thinking out of old grooves."

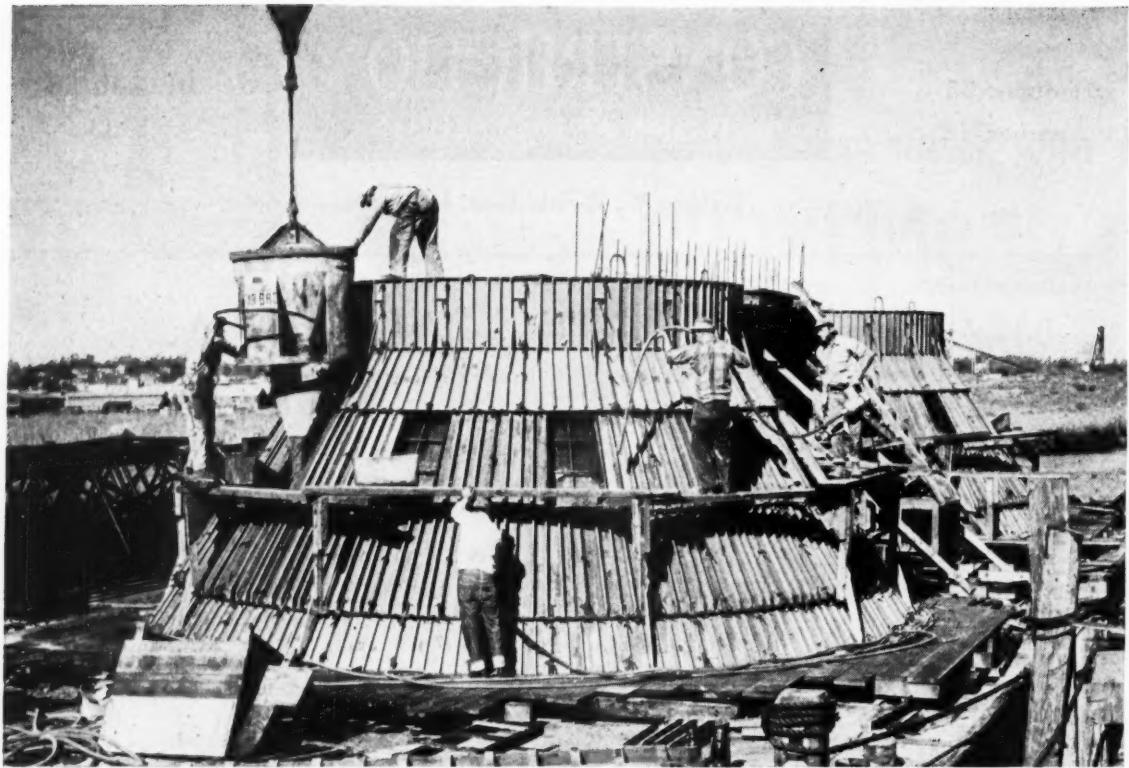
The Central Constructor, Iowa AGC publication, dissected the proposal line by line, analyzing each thought

with cryptic, yet favorable, comments of its own. Interesting and pertinent excerpts from many of the comments we have received are published elsewhere in this issue, beginning on page 163.

We don't think for one moment that we have the final answer, and perhaps not even the right answer, to the construction labor problem. But until someone comes up with something better, we'll continue to advocate one united construction union. We're convinced more and more, day by day, that something must be done, and changes must be made if the great construction industry is to operate to utmost efficiency and economy in the interests of private and public buyers of construction.

Somehow, jurisdictional disputes that hamper introduction of new and more economical materials, featherbedding practices that add nothing but cost to the job, and the wasteful, archaic labor organization along present craft lines must go. Somehow a more enlightened labor-management relation must prevail in construction. One united construction union is the most promising answer. Any more ideas?

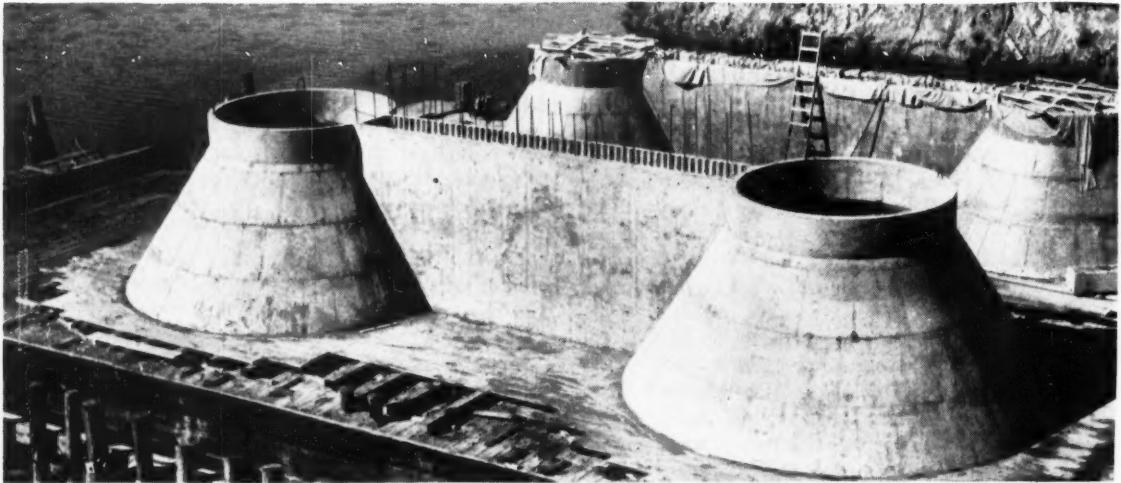
Rich



THROUGH THE WINDOW goes another bucket load of concrete for a 90-ton shell for a pier of the Richmond-San Rafael Bridge across the north arm of San Francisco Bay. Sectional steel forms

contain "windows" around the mid-section to make for better concrete placement and vibrating around sloping base of the structure. Casting is done in yard 20 mi from bridge site.

Steel Forms Mold Concrete...



SIAMESED PAIR of pier shells curing on platform aboard barge where cast. Another pair is in background. Lifting lugs are cast into

each cone unit. Heaviest pieces are cast directly on barges riding on a tidal arm to eliminate one lifting operation.

...Create Bridge Pier Shells



THOROUGH VIBRATING makes good concrete, prevents voids inside sloping form. Viber electric unit is applied through window halfway up, and small pneumatic hammer below gives the additional kick to assure full contact. Simple clamps hold forms.



METAL CHUTES guide concrete pouring from 2-yd Gar-Bro bucket into the top of the forms. Several chutes are used because concrete in the 7-in. thick walls is cast in lifts of only about 1 ft each. Note special tube on bottom of bucket.

By L. L. WISE, Associate Editor

PRECAST CONCRETE SHELLS are being built in large numbers to construct piers for the Richmond-San Rafael Bridge under construction across the north arm of San Francisco Bay. Substructure joint-venture contractors Ben C. Gerwick, Inc., and Peter Kiewit Sons Co. are using concrete shells in preference to steel shells that cannot be recovered.

Casting is done efficiently in a yard on a tidal arm some 20 mi from the bridge site. Yard procedures and reusable forms, combined with gantry crane units, turn out pier shells on an economical and easily controlled basis. Haul to bridge site is by barge, and the larger units are cast directly on barges to eliminate one handling.

Careful erection of forms and assembly of reinforcing steel is an important operation. As all concrete elements must fit together in deep water, care is taken to assure that joining surfaces are true. Care in precasting also will prevent loss of tremie concrete that will be



FORMS FOR TWIN SHELLS partially assembled, ready for reinforcing steel. Barge-cast units use forms made by Economy Form Co. specially for the job. Sections of steel form are planned for use on different size cones and are used a number of times over.

used to fill shell assemblies after piledriving and placing operations get under way.

How these various units fit together for construction of the bridge substructure will be explained in a subsequent article. On-the-job photographs will be included. At this writing, casting operations are at peak.

Steel forms are used again and again, and sections are designed to fit several sizes of the precast shells. All concrete comes from a near-by independent batch plant.

The bridge is a project of the California Department of Public Works under N. C. Raab, project engineer. The \$14-million substructure contract is managed for Gerwick-Kiewit by Don Weaver, project manager, and Jack Weiss, superintendent of the casting yard.



CORRUGATED INSIDE FORMS are used for smaller, shore-cast units to create a better bond with tremie concrete poured on site later. These are 8-in. wide Irvington steel elements assembled in 4-ft increments. White tape seals space between 4-ft units.



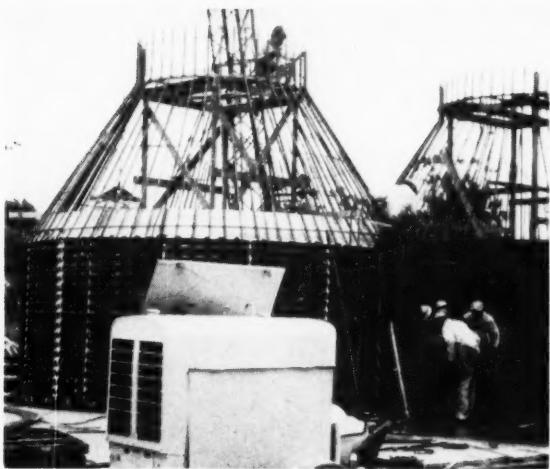
PILEDRIVING GRIDS are cast in area normally used to cast concrete piles. Traveling gantry in background pours concrete. Circular grids

guide H-piles being driven under water. Note two relatively small cones cast on platform in foreground.

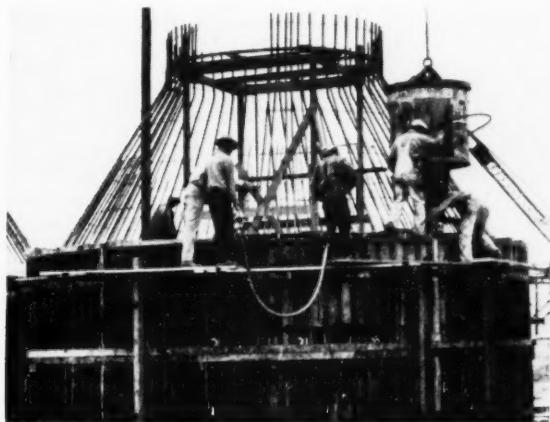


FORM BOXES being set to leave holes in grid for H-piles to be driven through them. Boxes are collapsible, with steel parts supplied

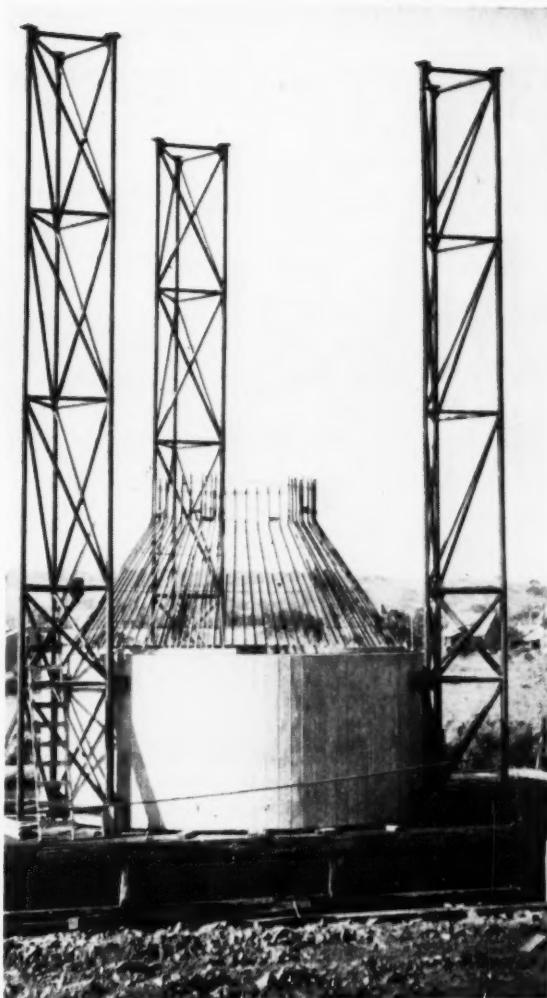
by the Troel Co. In the water, grids set on wood falsework piles cut off to grade, serve as bottom forms.



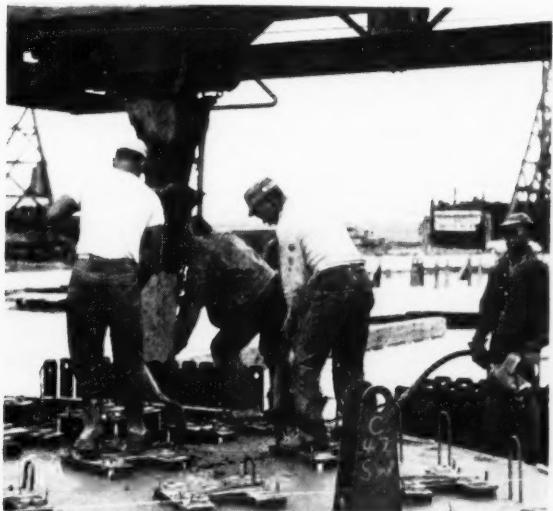
REINFORCING IS WELDED to hold it in place during pouring operations. Portable Lincoln welder rolls easily from form to form. Rubber tape makes forms more flexible for easier stripping.



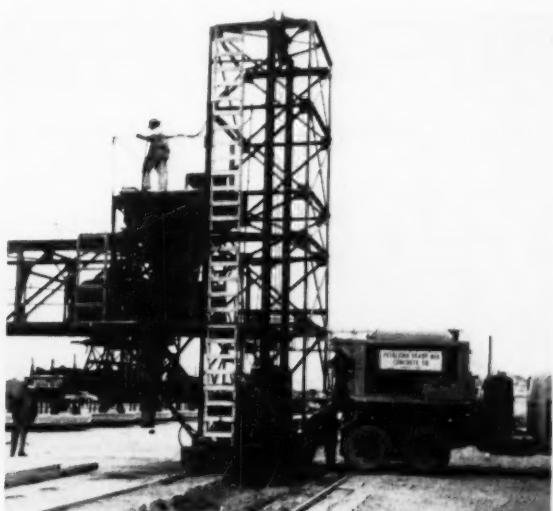
PLANK RUNWAY attached to forms serves workmen during casting of bell units. Steel above form will be encased in tremie concrete.



STEEL TOWERS are bolted to bell unit after it is set on barge. Towers will guide bell to proper seating under water, then be removed.



TRAVELING HOPPER on gantry pours concrete into grid form. Reinforcing loops are for bond with tremie concrete poured when all units are in place at the bridge site.



SKIP ON GANTRY receives concrete from truck mixer, then elevates and dumps into supply hopper from which it is released, as needed, into traveling hopper. All concrete is transit-mix.



PIPELINE EMERGES from deep waters of Straits of Mackinac after 4-mi pull from distant shore. Pontoon atop nose of 20-in. pipe gave

added buoyancy during pull, while pontoon or mandrel set into 2-in. pulling cable ahead of it helped to smooth its path.

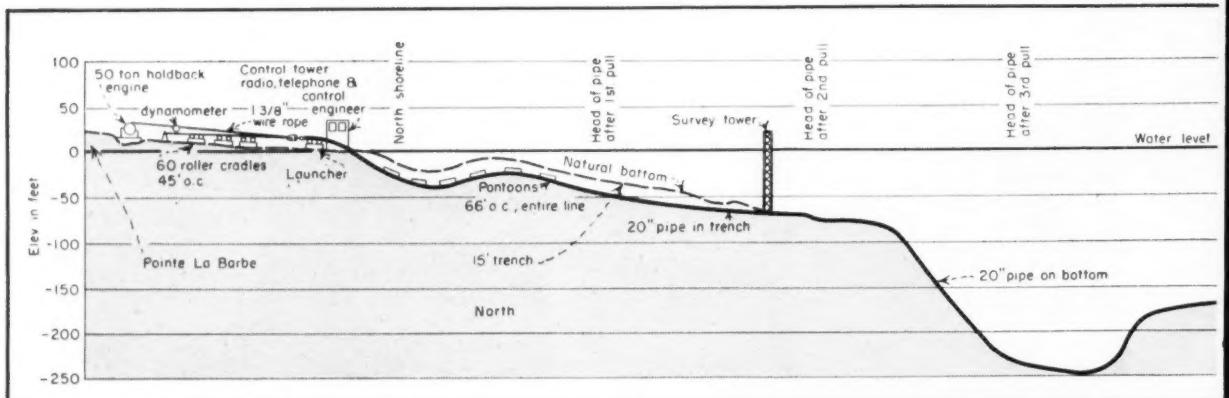
Twin Pipelines Cross 4-Mile Straits

SUBMARINE PIPELINE HISTORY was made early this fall when two 20-in. oil lines were strung across Michigan's 4-mi wide Straits of Mackinac in water as deep as 246 ft. Pulled by 2-in. wire rope and two 50-ton winches, pipe was launched in 2,500-ft strings

from a series of articulated cradles and had its submerged weight reduced to only 6 lb per lin ft by remote-release pontoons.

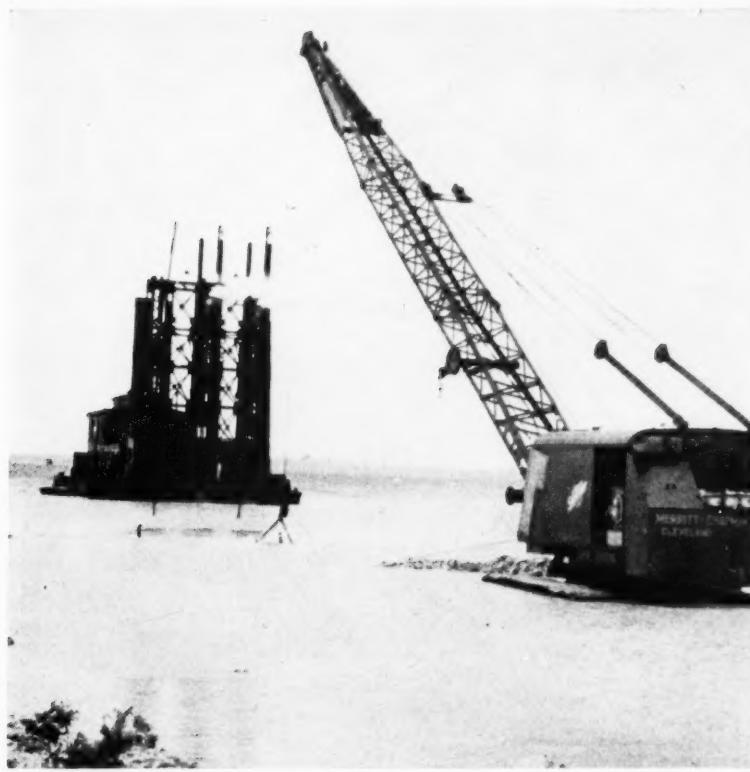
The twin parallel crossings were installed by general contractor Merritt-Chapman & Scott Corp. At the junction of Lakes Michigan and

Huron, they are the key underwater link in Lakehead Pipe Line Co.'s extension from Superior (Wis.) to Sarnia (Ont.). They were also the most expensive (\$8½-million) and most difficult stretch of the new \$76-million, 635-mi crude oil line. And they are prob-



PIPELINE PROFILE shows conditions after sixth 2,500-ft pull has been made, with head of pipe three-quarters of way across. It is

launched from north shore (left) and pulled south. A 2,500-ft section of pipe is added, and a 2,500-ft length of cable is removed after



DRAGLINE SUBMERGES to top of its crawlers as it excavates trench for pipeline at start of job. Drill boat ahead of Speedcrane prepares rock for blasting from 15-ft deep trench.

ably the deepest such crossings ever successfully completed. At that, actual pulling time for each of the two 20,000-ft lines was only 34 to 35 hr—a launching speed of better than 10 ft per min.

In preparation for the pull, 15-ft deep trenches 1,300 ft apart were dredged for both lines from both shores out as far as the -65-ft contour. In water deeper than that, the pipes rest uncovered directly on the Straits bottom. Sonic sound-

ings with a Raytheon Fathometer, rigged to read to less than 6 in., pin-pointed high spots to be removed from this part of the crossing. In all, more than 1,000,000 cu yd of material had to be dredged.

Meanwhile, pipe for each line was readied for launching from the north shore. The 20-in. steel pipe (13/16-in. wall thickness; 166 lb per lin ft) was delivered in 27-ft lengths that were made up into eight 2,500-ft strings for each

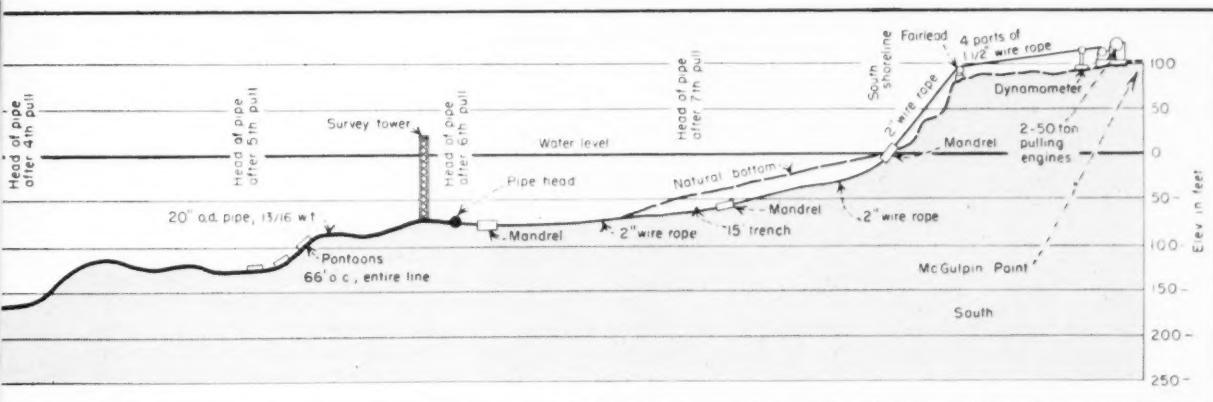
crossing. Eight passes completed the welded joints, all of which were X-rayed. Typical pipeline operations of cleaning, priming, coating and wrapping with fiber-glass matting followed. Then 1x3-in. wood slatting was banded to the pipe's lower one-third perimeter as additional protection against abrasion during the pull.

Launching, flotation and pulling equipment was set up for installation of the westerly line first. An articulated launcher developed by submarine pipeline specialist Sammy Collins of Collins Construction Co. (see "Four Ways to Dunk a Pipeline," CM&E, June '52, p. 56) was placed at the north shoreline. The device's 18 rotating rubber-tired wheels supported the pipe at six points over a distance of 120 ft to ease the stress as it made the transition from air to water.

A line of 60 Collins articulated cradles on 45-ft centers stretched inland from the launchers to support a 2,500-ft string of pipe. Cradles consisted of a fixed base frame holding a trunnion-mounted scale beam, each of whose ends carried a trough of three rubber-tired wheels over which the pipe rolled ahead.

At either end of the line of cradles, holdback arrangements were set up: A running holdback at the rear to prevent the pipe from over-running itself during the pull; and a standing holdback at the front to anchor the launched pipe while the next 2,500-ft length was attached.

Running holdback was a steam-operated Johnson 50-ton marine towing winch whose 1 3/4-in. cable led through a sheave fastened to the rear of the pipe, thence back to a deadman. A Vapor-Clarkson



each pull. Weighing 166 lb per ft, pipe is supported on shore by 60 articulated roller cradles. Pontoon attached every 66 ft reduce its submerged weight to only 6 lb per ft. Mandrels help keep the pulling cable from cutting into bottom.



FLOATING EQUIPMENT FLEET for twin submarine pipeline job is framed in legs of survey tower at launching site. At height of work it included 12-yd dipper dredge with 50-ft stick, 9-yd dipper dredge

with 40-ft stick, 22-in. hydraulic dredge with 86-ft ladder, three derrick boats handling 4-yd clamshell buckets, plus associated small craft. In foreground is launcher for pipeline.

generator supplied steam to the winch. Standing holdback, near water's edge, was an anchored open loop of 1½-in. cable fitted with turnbuckles at each end. These gripped the pipe through a stop-clamp 5½ ft long, bolted around the pipe with 34 high-tensile 1-in. bolts.

Dynamometers were set on both running and standing holdbacks. These, in conjunction with a third dynamometer on the main cable at the pulling winch, enabled the pull to be coordinated to keep the pipe under tension at all times.

The pulling winch was installed, and securely anchored, about 2,600 ft back from the shore on the opposite (south) side of the Straits. It was a dual-drum unit powered by a 180-hp diesel engine and capable of a 210-ton single-line pull. Each drum spooled 2,750 ft of 1¾-in. wire rope cable.

From the winch, a derrick boat laid a pulling cable back across the Straits to the pipe-launching sta-

tion. Some 7,500 ft of this cable closest to the winch was 1¾ in., the rest was 2 in., all of it Bethlehem 6x19 wire rope. Cable was made up into 2,500-ft lengths coupled together by an assembly of swivels, clevises and cargo plates. These cable lengths corresponded to the 2,500-ft strings of pipe. Following each pull, one section of cable was to be removed after a line from the winch's other drum took over the strain at the next section. This transfer was to be effected through a cargo plate at the joint.

To help keep the heavy cable from burying itself in the bottom, a strong steel 3x12-ft pontoon or mandrel giving 800-lb buoyancy was incorporated in each joint assembly. When it reached the north shore, the end of the cable was fastened to a watertight pulling dome welded to the nose of the first pipe string.

Before launching, Collins pontoons were fastened to the pipe to

reduce its negative buoyancy from 32 lb to 6 lb per lin ft for easier pulling. Spacing the 3½x5-ft cylindrical units on 66-ft centers gave this desired effect, while 100 psi air inside them prevented their collapse in the deep waters of the Straits. Pontoons were attached with two double wraps of steel strapping 2 in. wide.

With all in readiness, and with the far-flung operations coordinated by telephone and radio, pulling the first 2,500-ft pipe string of the 20,000-ft crossing was begun; the pipe rolling smoothly over the cradles and launcher and into the water at about 10 ft per min. However, part way through this first pull, the diesel winch snapped a shaft at approximately 45 tons and had to be replaced before the pull could be resumed.

Two 50-ton single-drum Johnson towing engines like the one on the holdback were substituted for the broken 210-ton winch. But the substitution of the less powerful units

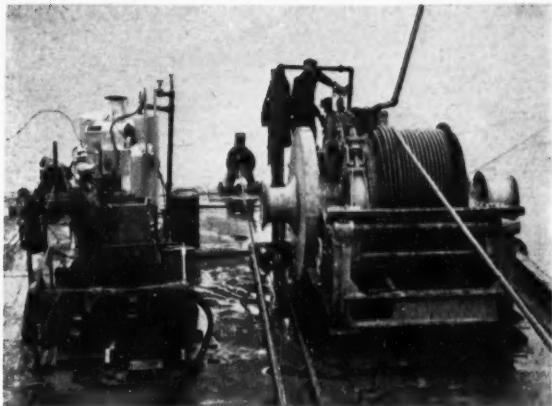


DERRICK BOAT shrouds herself in steam as she lays wire rope across Straits for pulling the pipeline. White object on deck of Wiley rig (rated 75 tons at 65 ft) is one of cable's mandrels.

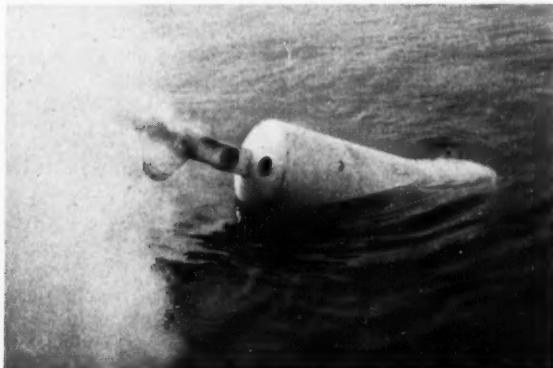
with smaller drum capacities called for a change in rigging.

Each engine's drum spooled 2,700 ft of 1½-in. cable. This was run around one sheave of a floating double block common to both cables, and was becketed off back at the winch base. Thus each winch had a mechanical advantage of 2 (and the entire assembly an advantage of 4, or 200 tons). At the same time, of course, reach was cut in half to only 1,350 ft vs 2,500 ft in each section of the main pulling cable.

To overcome this, a 1,250-ft pennant of 2-in. cable was made up, to be hooked between the double block and the pulling line. When 1,250 ft had been pulled, one winch held while the two-part line from the other was run out 1,250 ft and hooked to the joint between pulling-cable sections. The pennant was removed, and the other winch cable was hooked to the joint with its mate. The two winches (with an assist from a derrick boat tug-



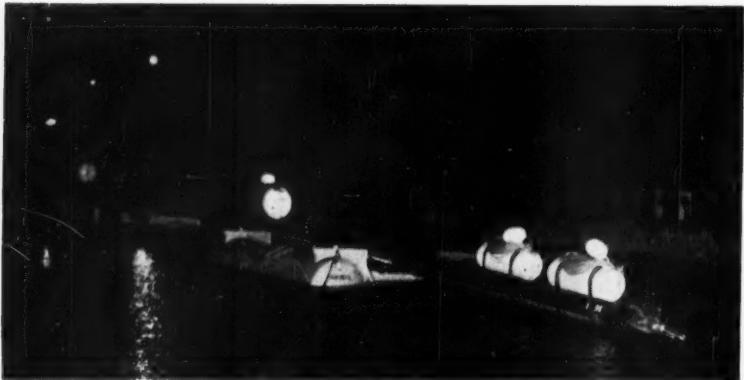
PIPE-PULLING CABLE unreels from winch on deck of derrick boat as it pulls itself across Straits by lines to anchors. Cable is 2-in. 6x19 wire rope made up into 2,500-ft links. By paying it off winch drum, cable can be kept straight and under tension.



CABLE MANDREL is integral pontoon that adds 800-lb buoyancy to wire rope. Cargo plate (almost hidden in steam vapor) is triangular steel unit with three holes for easy transfer of load.



ARTICULATED LAUNCHER supports pipeline on six sets of rotating rubber-tired wheels to ease it into water. Wheels are mounted at ends of scale-beam arms for stress equalization.



PIPELINE NOSE slips smoothly into water, as first of two crossings starts 20,000-ft trip across Straits at 2:40 am. Actual pulling time was 34 to 35 hr for each line, at a launching speed of more than 10 ft per min. Maximum depth of long crossing is 246 ft.



HOLDBACK at rear of pipe keeps it from over-running itself during pull. Two-part cable from 50-ton winch handles this job.

ging on the cable in the water) then pulled the remaining 1,250 ft.

When the tail of the first pipe string reached water's edge on the north side, the standing holdback was attached, and the running one removed. Side-boom tractors lifted another 2,500-ft string of pipe on to the cradles for welding into the line. Meanwhile, on the other shore, workers re-attached the 1,250-ft pennant and removed the 2,500-ft section of pulling cable just landed.

After the second pipe string and cable were readied, the pull was resumed. Additional pipe lengths were added and sections of pulling cable removed until the entire 4-mi crossing was installed. Pulling time for the first crossing was 35 hr, but elapsed time was some 7 days—mostly spent on winch replacement. Maximum pulling stress recorded on the dynamometer was 75 tons.

With the pipeline pulled, it was filled with water to take out any

slack in the line and hold it firmly on the bottom. For this operation, 8,500 ft of greased 4-in. pipe was pushed inside so filling would take place from the deepest section of the line.

Popping the Pontoons

Then, after a hydrostatic test on the line, its pontoons were released consecutively. This was accomplished from the surface by pulling up a trip line running along the pipe, which freed small buoys at each pontoon. The buoys carried to the surface a messenger line, which in turn ran to a bridle fastened to levered cutters on the pontoon's two attachment bands. Pulling the line cut the bands simultaneously, and the pontoon popped to the surface for recovery.

After the first pipeline was installed, all equipment was moved over and set up to pull the second. Pulling this one took only 65 hr of

elapsed time from start to finish, with 34 hr of pulling time. Backfilling the dredged trenches completed the twin pipeline crossing.

General contractor for the Straits crossing was Merritt-Chapman & Scott Corp., Cleveland. Vice-president Sherman H. Serre headed operations. Joseph S. Troxell was project manager, and Capt. John I. Tooker was pipe-pulling superintendent. Collins Construction Co., Victoria, Tex., furnished launching and flotation equipment. Sammy Collins directed his firm's work, with Billy Glascock as general superintendent. Bechtel Corp., San Francisco, was agent for Lakehead Pipe Line Co. on the entire 635-mi extension of which the Straits crossing was a part. For Bechtel, Clark P. Rankin was project manager, Ray L. Hamilton was pipeline consultant, and Ed Quiet was construction manager at the Straits.



PIPE STRING is set on to cradles by side-boom tractors in preparation for another 2,500-ft pull. When in place, pipe will be rolled ahead for welding into the line, and pontoons attached.



WELDING STATION, just shoreward of launcher, is busy place between pulls. Pipe section is welded on here, and joint X-rayed and coated. Buoyancy pontoon already has been attached to pipe.



Controlled shots from Prehy placer through 2-in. hose fill forms as . . .

Air Placement Cuts Column Concreting Costs

AIR PLACEMENT is far superior in placing ease and labor and time saved over former methods used by F. H. McGraw & Co. when enclosing structural building columns with concrete. It saves better than 20% in dollar costs for labor ordinarily involved in extra handling, pouring, patching, rubbing and cleanup.

McGraw & Co. of Hartford, Conn., is prime contractor for the Atomic Energy Commission's bil-

lion-dollar gaseous diffusion plant under construction near Paducah, Ky. Within the huge project are a number of large structures with thousands of steel columns that require encasement, specified chiefly to reduce vibration frequency.

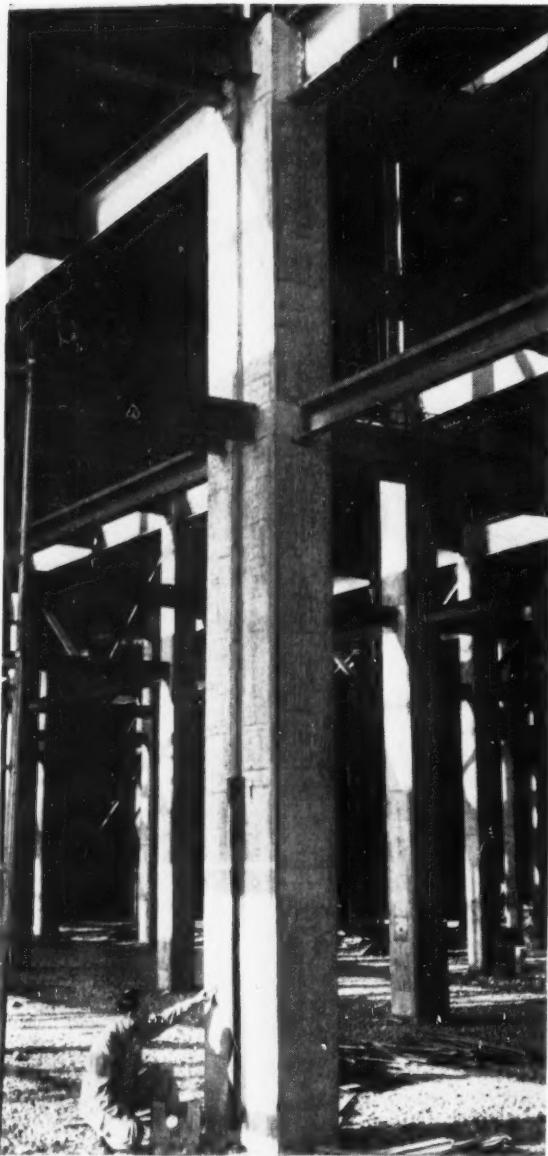
Column concrete is pumped into prefabricated forms with Prehy material placers (more commonly known as grouting machines) which use compressed air to force a load of concrete through a 2-in.

hose. Concrete is not dumped into the top of the form but is pushed through the side of the form past a special sliding gate which is closed to hold the wet concrete inside when a form is full. Columns are filled to a height 28 ft above the ground floor.

On the average, each Prehy machine encases from 10 to 12 columns per work shift—although as many as 14 per shift have been done.

(Continued on next page)

AIR PLACEMENT . . . Continued



FINISHED COLUMNS, encased for 28 ft up from the ground in a single operation, present a pleasing appearance; no honeycombs, and material is well integrated without using vibrators.

McGraw usually operates two concrete placers at one time with a single 315-ft compressor. It is not high air volume and high pressures that do the work, but intermittent "blowing" with close control through a fast acting valve on the machine.

Pea gravel concrete is brought to the placers in transit-mix trucks and chuted directly into the cylindrical pressure tanks of the little machines, 3.5 cu ft to a "shot." It is ejected through the bottom of the placer when the discharge valve is opened and air pressure carries it through flexible hose into the

column form. Then the filling and ejection cycle is repeated.

Experience shows that best results in placing concrete are obtained with low air pressures. Intermittent placing and close control of the material thoroughly integrate the concrete; there is no honeycombing, and vibrating is unnecessary. In addition, there is only a minor amount of patching and rubbing after forms have been stripped.

Forming costs are decreased, too, since the windows previously required to spout and vibrate concrete can be eliminated. At first, a



PIPE ADAPTOR for hose connection from pneumatic concrete placer bolts on one side of the prefabricated form. Workman sets sliding gate which becomes shut-off when form is filled.

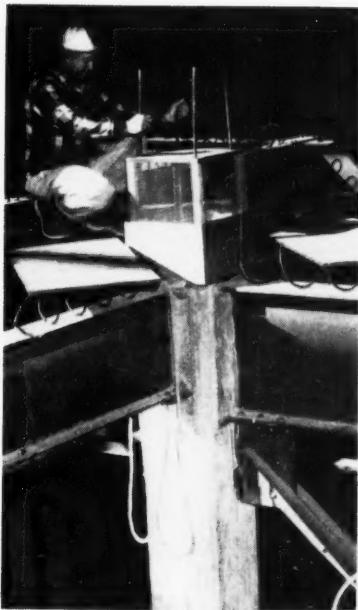


SMOOTH SURFACES showing grain of the plywood form are the rule. No rubbing and patching are required beyond knocking off fins left at form joints. Note markings left by pipe adaptors.

2-ft wood-and-wire extension cap or "hat" was nailed temporarily to the top of a form being filled to allow for surge and settlement and to prevent spatter over the top as a form filled to its top. But placer operators soon became so proficient that the hats were eliminated and the column form was extended an extra 18 in. merely to allow for surge.

Concrete mix used is as follows:

658 lb cement, regular
1,270 lb sand, passing $\frac{3}{8}$ -in. screen.
1,500 lb pea gravel, minus $\frac{1}{2}$ in.



TOP-OF-COLUMN HAT of wood and wire shown as used at first as form filled to top to prevent spatter. Prehy operators soon became proficient in concrete control and hat was not needed.

2 oz Darex or Protex, entraining 3.7 air

This mix gives a water-cement ratio of 1:5.66, a unit weight per cu ft of 139 lb, a design strength of 3,000 psi in 28 days, and a 6-in. plus slump. Slight variations are made to allow for moisture content in the aggregate. Mixing is done in a small batch plant.

No rubbing and patching are required other than knocking off the fins that occur at joints in the form, and knocking off and smoothing the exposed nibs where concrete was pumped into the form. Block-outs made in the column forms are scabbed on, leaving a $\frac{3}{4}$ -in. projection at the intermediate struts to eliminate fitting time around the struts.

Labor assigned to operation of a placer is held to a minimum. Loading of the hopper, moving and connecting the hose and occasionally washing off the machine is done by two men, who also act as spotters for the mix trucks. An additional man is stationed at the top (open end) of the column form to check the progress of the concrete and to indicate when it reaches the required elevation. He also hoses off concrete which occasionally spatters out of the top of the form to surrounding structural steel. Column concrete

placed pneumatically frequently is stripped the following day, materially decreasing the number of forms required for this operation.

For a total of 2,419 encasements of five variations in size, McGraw obtained approximately 16 re-uses of the $\frac{3}{4}$ -in. plywood forms before the plywood was replaced. Ordinary steel column clamps, spaced approximately 12 in. on vertical centers, are used to hold the column forms together, and no adverse buckling or bulging of the forms due to pressure is encountered.

Indicated total saving in labor dollar cost for all column operations amounts to approximately 22.2%. The indicated saving in productive man-hours for the concrete placing operation alone amounts to more than 27,000 man-hours for one large AEC process building.

Since all column encasement by the pressure-placing method is accomplished from the ground floor, labor costs for handling and raising concrete to the second floor—as well as labor and material costs to provide temporary runways—are eliminated.

Independent

The most important advantage of the pressure method is to divorce the column encasement operation, make it entirely independent of other construction operations (like the second floor forming) within the building.

This method of placing concrete requires a machine somewhat different from a simple grouter and allowing intermittent, rather than continuous service. Machines employed by McGraw & Co. are Prehy placers, made by the C. L. Ballard Company, New York. These machines are designed for working pressures up to 125 psi.

Flexible hose which conveys the concrete into the form is of 4-ply duck with high grade abrasive-resistant rubber covering and 3/16-in. pure rubber tube lining with special Fulflo couplings. Bursting pressure is 500 psi. The average life of a section of this hose was from 75 to 120 columns at the start, due to the abrasive action of the aggregate. Later experience indicates that a life expectancy of 150 columns will be average. The air supply line from the compressor has a diameter of $\frac{3}{4}$ in.

Job Coordinator John Cantwell suggested the use of this system of column encasement for McGraw.

He enlisted the aid of the manufacturer of the little pneumatic placers to get the job going on a high-production basis. McGraw & Co. is certain to make considerable use of this method in the future.

Fred Mayo is project manager for the contractor and Jack Curlee is deputy project manager in charge of construction. Bob Hardin is construction superintendent for the area where this work is done.

Made It Work

C. L. Ballard, manufacturer of the Prehy machine, long has envisioned the placing of concrete around columns and beams with small pneumatic machines. The method was tried out several years ago on a New York Port Authority job on steel columns which are part of an approach to the Holland tunnel. The first try was only partly successful but developments in procedure since then have made the method feasible commercially.

Pneumatic column encasement is a production operation. To make it pay off, another busy crew is required—to fabricate and place wire mesh and rod reinforcing and to build, erect and strip forms.

Remember the Trucks!

FAITHFUL SERVANTS have a right to some special recognition when there is time to relax. The contractor's faithful servants are the highway-type trucks that do a thousand odd jobs every week—from the little pickups that run endless errands to the larger utility haulers that go off on a moment's notice for equipment and supplies.

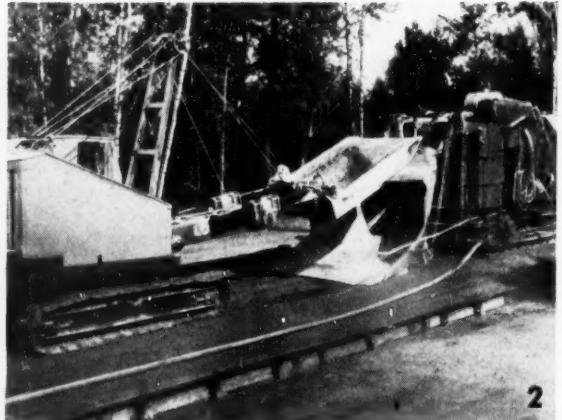
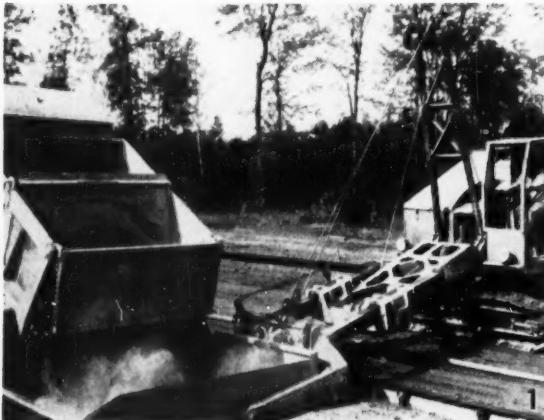
Now is the time to check them thoroughly and recondition against the next busy season. Most of them are so handy that they are operated winter and summer, often with little attention maintenance-wise until they quit on the run. Give them a break (and yourself, too) by scheduling each pickup and utility vehicle for a checkup.

First, get the dirt and grime off. Then check brake lining, wheel alignment, springs, steering gear, fan belts, generators, starters, cooling systems, as well as the engine and lighting system components. Finally, give them a good lube job and you will be amazed at the difference in performance.



By transferring batches from trucks on shoulder to paver between forms . . .

Box-Bucket Shovel Ups Paver Output 10%



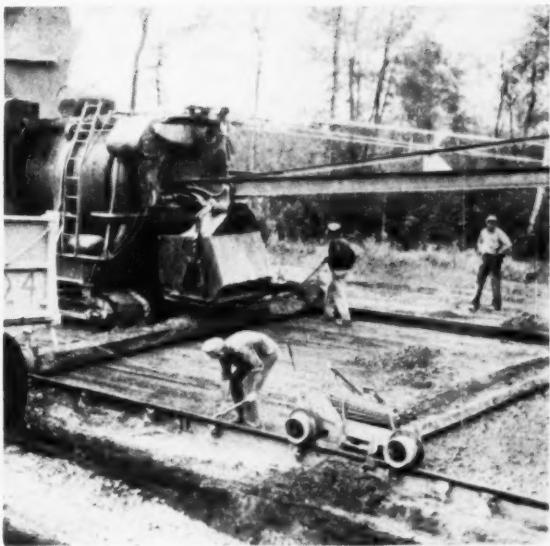
NEW PAVING TECHNIQUE revolves around Lorain machine carrying 6x10-ft box bucket that receives batch from truck (1), swings 90 deg to paver (2) and dumps into skip (3) while next loaded truck pulls into position to repeat cycle. Procedure keeps trucks off roadway's sand subgrade, eliminating need for wood runways, and speeds up paver operation.

A NEW TWIST in concrete highway paving, plus a new piece of equipment to make it practicable, have just made their debut in Michigan's Northern Peninsula. The innovation is to operate the paver between the road forms, yet keep the batch trucks outside the forms at all times: A power shovel with a special box-type bucket transfers the batch from truck to paver skip. Brainchild of contractor John Pierson, the unusual technique has increased paver production from 72 to 82 batches per hr and decreased paving costs. Here's how:

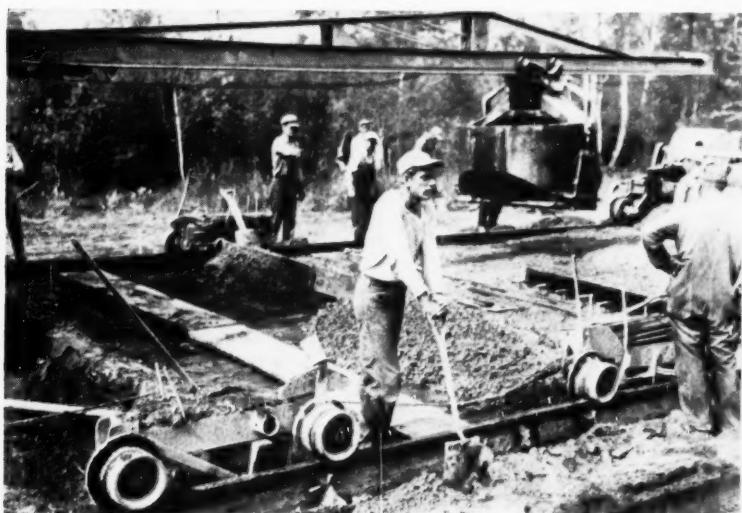
Pierson Contracting Co.'s \$737,-



STEEL ROAD FORMS are pinned and bedded after being stripped and moved ahead by winch truck. Schramm Pneumatractor powers Thor pin driver and two Chicago Pneumatic tampers with T-heads.



TWO SCREEDS are pulled along by Koshring 34-E dual paver. First screed gives subgrade a final planing, second one strikes off the first course of concrete so reinforcing mesh can be placed.



WOOD PLANKS placed on highway subgrade keep concrete out of area where dowel-bar assembly for transverse joint will be installed.

Planks are lifted out (right photo) to uncover the clean subgrade after the first lift of concrete has been dumped and screeded.



000, 8-mi job on State Route 35 south of Escanaba is fairly typical of Michigan roadbuilding conditions. It calls for 101,000 sq yd of 8-in x 22-ft pavement, mostly on new location, poured full width at one time. Native subgrade is generally a rolling sand. And where it is otherwise, specifications call for a 15-in. sand cushion to be placed as a base for the slab. Seldom is the shoulder (usually 8 ft) wide enough for operation of more than one piece of equipment. This means the paver must travel between the forms to leave room for batch-truck travel outside.

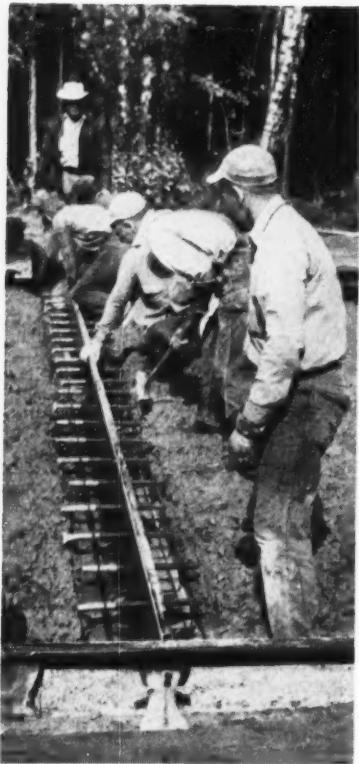
On earlier jobs of this type, it was necessary to leave out a couple of road forms temporarily, every 500 ft or so, to let batch trucks move to the subgrade from the shoulder. Duck-board runways had to be placed so the trucks could back up to the paver without getting mired in the sand. And careful driving was necessary to stay on them and hit the skip square.

Then, too, the duck boards had to be lifted out, loaded on a truck on the shoulder and moved ahead as the paver advanced. All this not only took extra time and manpower, but occasionally resulted in

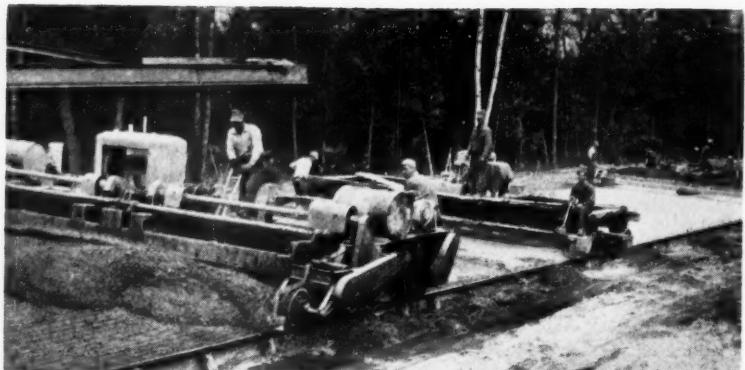
over-runs of concrete due to rutted subgrades.

Now, that's been eliminated. The batch trucks stay on the shoulder, and the paver is preceded down the subgrade by a crawler-mounted Lorain TL-25 Scoop Shovel carrying a 6x10-ft box bucket designed and built by the Thew Shovel Co. at Pierson's request. The box is spotted beneath a loaded truck's tailgate, the batch is dumped, and the shovel swings 90 deg to unload into the paver's skip.

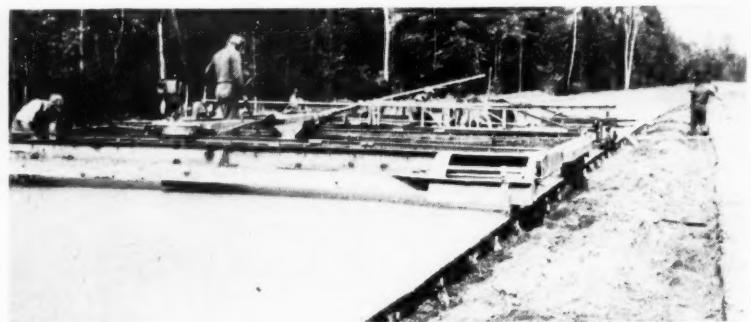
Trucks need not turn around, back up, or wait for the skip to



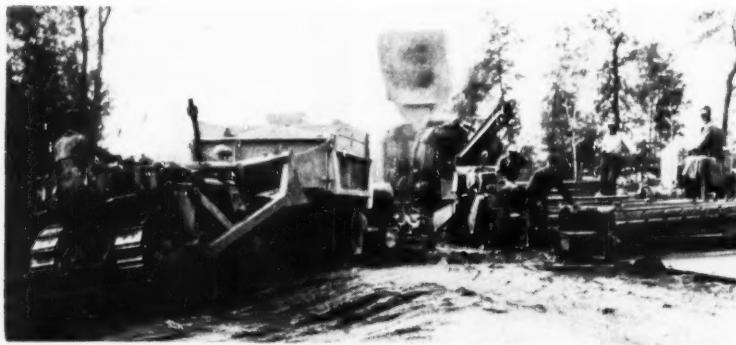
JOINT ASSEMBLY is spiked in place, resting on oiled metal sheet that forms sliding plane between concrete slab and subgrade.



CONCRETE SPREADER distributes top course of paving, is followed closely by transverse finishing machine. Former carries Jackson vibrator for consolidating mix along forms.



LONGITUDINAL FINISHER and machine for embedding centerline joint filler bring up the rear of the paving train. Roadway's sand subgrade would be as rutted as this shoulder if batch trucks had to ride it to feed paver directly, without using transfer shovel.



LOADED BATCH TRUCK, stuck in the sand, is given a boost by Caterpillar RD4 bulldozer. Think what this would do to prepared subgrade if truck were on it instead of shoulder.



LOAD OF DIRT is rushed in by D-Roadster Tournapull to firm-up shoulder and prevent other batch trucks from miring in sand. Wide-base tires help compact sand-dirt mixture.

be lowered, so 10 to 15% fewer are required. And the trucks dump into the pan easier and with less spillage (less than 0.1%) than into the skip. Net result is an increase of 10% in production—the 34-E dual paver turning out 80 batches per hr, and the pavement consistently going in at the rate of 1/3 mi per 9-hr day. Paving was begun on Sept. 14 and finished on Oct. 14. Best day's production: 1,893 ft.

This good pace is not entirely the result of the new technique for Pierson's job is well co-ordinated and well planted throughout.

The aggregate batching plant is set up about a mile from one end of the job, where a pit of excellent gravel is handy. Processed in a Cedarapids portable plant, stone and sand each is loaded by clamshell into its own 50-yd Butler two-compartment batcher. Between the two sets of bins is a 250-bbl Butler bulk-cement batching bin with a 400-bbl storage silo alongside.

The two-batch trucks that haul to the paving site drive first beneath the stone bins to have both boxes loaded simultaneously, then move on to make two quick stops

(Continued on page 66)

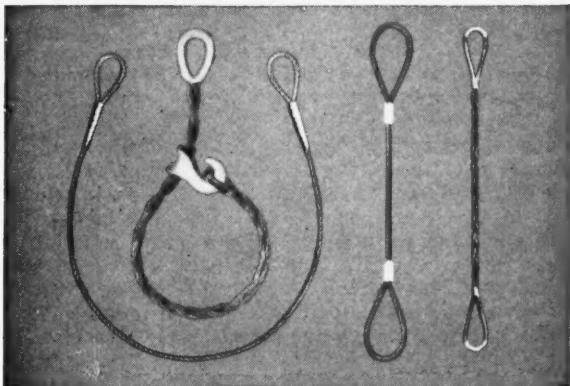


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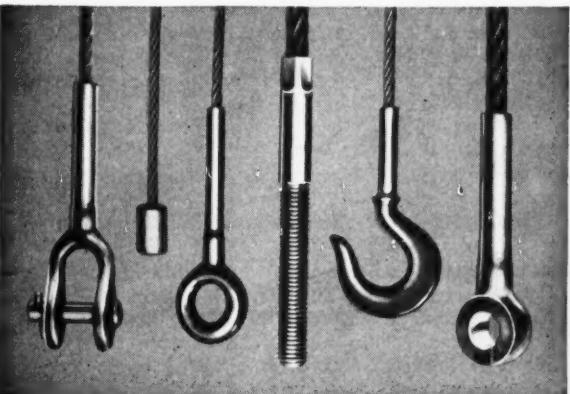


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for machine parts, controls,
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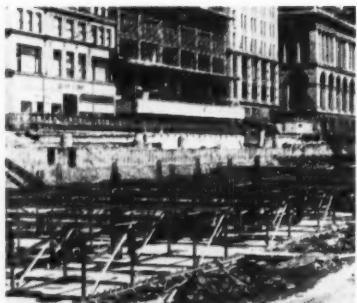
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BATCHING SETUP consists of dual stone bins fed by Northwest No. 6 with 1½-yd clamshell bucket (left), cement bins into which bulk truck unloads, and dual sand bins fed by Lorain 75 with 1-yd bucket. With this dual setup, two-batch trucks need only make one stop for stone, two for cement and one for sand. Stockpiles in rear hold 35,000 tons.

for cement, and finally receive both of the sand batches at one time.

Paving operations begin with use of compressed air tools for both mechanized spiking and tamping of Heltzel 10x10-in. steel road forms, on which rides a Blaw-Knox subgrader. Next comes the Lorain shovel fitted with the box bucket, trailed by a Koehring 34-E Twinbatch paver. The latter drags behind it two H-beam screeds fitted with wheels that ride on the forms. The first screed, attached to the paver by pipe arms, planes the subgrade to exact elevation and cross-section. The second, moved ahead at intervals by cables from a winch on the paver, strikes off the 5-in. bottom course of concrete.

On this first course is placed a welded wire reinforcing mesh of No. 00 longitudinal wires on 6-in. centers and No. 4 transverse wires on 12-in. centers. Delivered in 15x10½-ft mats, mesh is lapped 13 in. lengthwise but is not carried through the centerline joint. Instead, ½-in.x2½-ft transverse tie-bars are dropped in at 40-in. intervals.

Transverse joints, on 100-ft centers, are somewhat unusual. Assemblies of 1x15-in. dowels on 12-in. centers are set on oiled metal slip sheets that extend across the subgrade and up the form sides to reduce friction with the ground. Contraction joints have a ½x2-in. parting strip; expansion joints (every 400 ft) are fitted with a 1-in. felt insert. Boards placed on the subgrade before the bottom course of concrete is dumped are removed before placing the top course to clear a space for the joint assemblies.

A Jaeger spreader distributes the

3-in. top course of concrete (which, like the bottom course, is a 5½-sack mix with a 1½-2-in. slump and 4-7% air, entrained with Darez). The spreader is followed by a Jaeger-Lakewood transverse finisher and a Koehring longitudinal finisher. Then comes a Flexi-plane joint machine that embeds a ¼x2½-in. premolded bituminous filler flush with the surface to make a centerline joint. After hand straightedging and burlap dragging, the pavement is covered with Sisalkraft curing paper to complete the job.

For the Michigan State Highway Department, J. A. Wills is district engineer and Rudy Ganga is resident. Leo Laundre is superintendent for Pierson Contracting Co., and John S. Pierson is vice-president and general manager.

The Pierson outfit really gets around the State of Michigan in a hurry. This season they laid a record amount of concrete with one paver: After completing 22,316 sq yd of 8-in.x22-ft slab near Champion in May, they moved 550 mi to Kalamazoo to put in 116,577 sq yd of 9-in. x 24-ft slab between June 1 and July 17; thence 250 mi to Harbor Beach and 102,687 sq yd of 8-in. x 22-ft slab between July 27 and Aug. 27; then another move of 420 mi to Escanaba and 100,819 sq yd of 8-in. x 22-ft between Sept. 14 and Oct. 14.



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New! Spectacular low-built lines with pick-up and panel floors as low as $22\frac{1}{2}$ inches from the ground . . . knee-high for loading ease! Lower running boards for easier entry! Lower hood for greater visibility!



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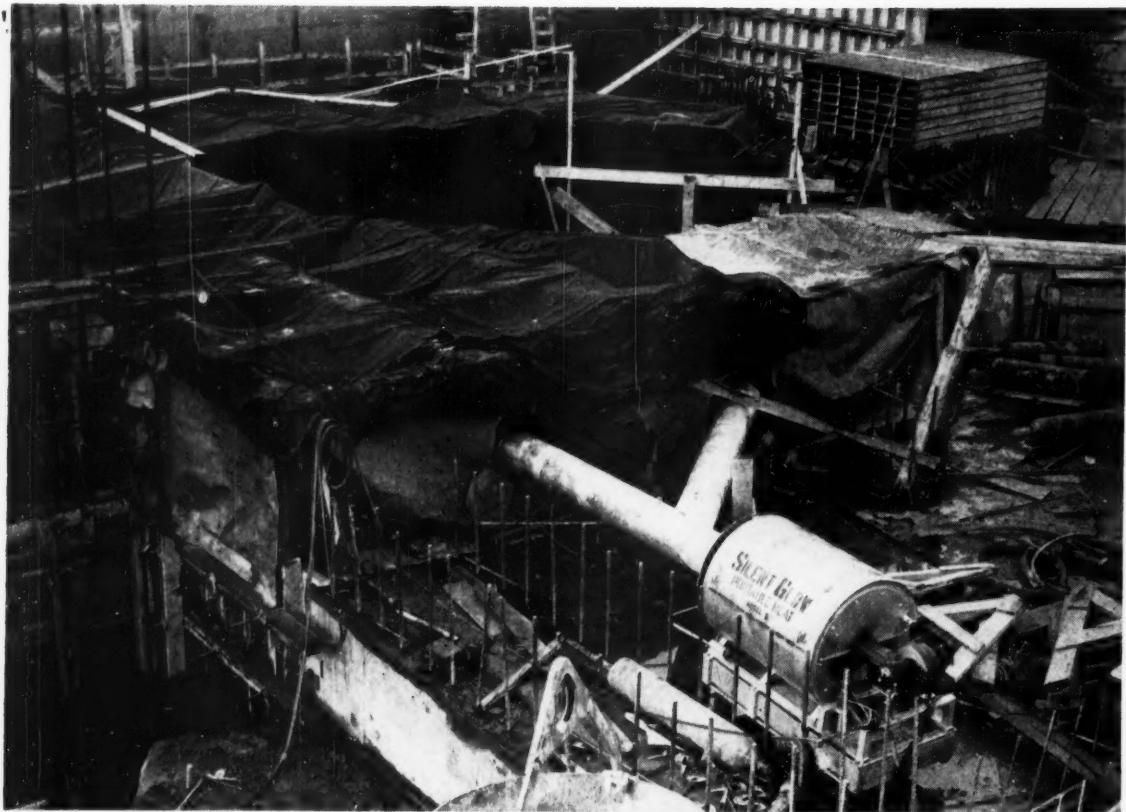
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NEW DODGE "Job-Rated" TRUCKS



CONCRETE CURES UNDER WRAPS during cold weather on a hydroelectric powerhouse job at Grahamsville, N.Y. Silent Glow forced-air heater drives heat under tarpaulins through metal ducts which radiate heat also. Heaters keep many winter jobs going.

Turn on the Heat

Part 2* Forced-air portable heaters keep large areas warm or spot-heat smaller spaces, materials and equipment.

Blower units come in radiant and non-radiant types, are designed to deliver heated air into remote places with ducts.

TEMPORARY HEATING for cold weather construction is controlled easily with forced-air portable space heaters that use powered blowers to circulate torrents of warm air.

In numerous construction operations work can be scheduled steadily through the winter, keeping the money coming in for the contractor and keeping his help gainfully occupied. Blower-type heaters will pay their keep many times over, and capacity needed can be specified with remarkable accuracy so that there is enough heat to meet cold-snap emergencies, without the contractor's equipment list being burdened with excessive inventory.

• **Forced-air portable heaters** are available in a number of designs and capacities and with enough latitude in extra accessories and special features to cover every reasonable need. There are two basic types: Direct-fired and indirect-fired.

Direct-fired models combine their products of combustion with the fresh air being heated and the mixture is blown into the area to be warmed up. Indirect-fired heaters exhaust combustion products through a stack which can be vented outdoors through a temporary flue. The heated air has been warmed indirectly on its trip through the blower-driven ma-

chine and is directed as the operator desires.

Manufacturers of each type insist stoutly that they have the answer to the contractor's needs and give reasons why. But first, let us look at their features.

- **Liquefied petroleum gas direct-fired heaters**, called Chinook Wind, are manufactured by the International Manufacturing Co. Leader of the line is the deluxe model measuring 2x3x4 ft and weighing 170 lb. Its burner is supplied by a tank of LP gas set alongside, delivers 375,000 Btu's at 250 deg. Its electric-motor-driven fan throws 3,500 cfm of heated air. Adapters on the cabinet receive either single or double ducts of treated canvas, as desired. A handy lifting handle tips the machine on two wheels for easy portability.

A utility model delivers 500,000 Btu's. In addition, there is a 35-

(Continued on page 70)

*Part 1 was published in the November 1953 issue of *Construction Methods and Equipment*.

How a CAT* No. 12 grades to fine tolerances



THE 16-acre Skyway Drive-in Theater, Nashville, Tennessee, must be resurfaced each spring before the season opens. McDowell & McDowell, of Nashville, do this job with a Caterpillar No. 12 Motor Grader. It pulls all the ditches and spreads crushed rock to a depth of 6 inches on the roads and 4 inches on the ramps. The project calls for moving 29,000 tons of stone, and the grader handles 1000 tons a day, making 4 passes over each line of ramp and road.

For good drainage and smooth parking a job of this kind demands grading to very close tolerances. And the Cat No. 12 "hits it on the nose." How is it possible for the big yellow machine to work within $\frac{1}{2}$ inch of grade?

Perfect balance of power, frame and blade is one reason. Others are positive, easy-acting controls, constant mesh transmission and full range of blade positions. But most important of all is job visibility. The operator *doesn't have to stand* to see his work. From the driving seat he can watch the front wheels and both ends of the blade, keeping them in exact adjustment.

Fuel economy, simplicity, durability and long life are other advantages of the No. 12 Motor Grader. No wonder Roscoe McDowell says: "If a fellow expects to stay in business he had better get Caterpillar equipment. It really does the job."

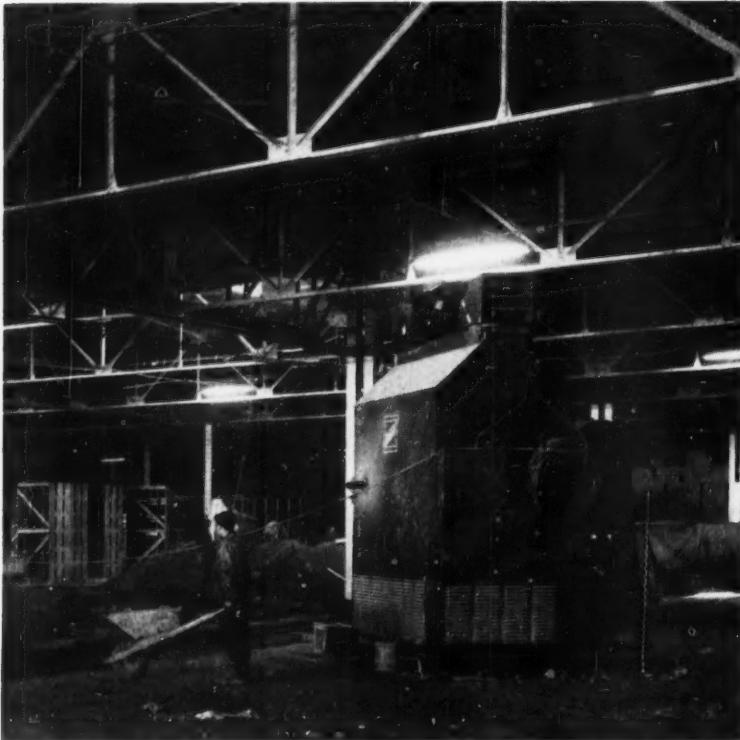
Your Caterpillar Dealer has the right machine for your needs. He'll demonstrate it for you right on your own job, and he'll back its profitable work life with reliable service and genuine parts. Call him today!

Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks - ®

NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE



GIANT SPACE HEATER (a Dravo Counterflow unit) normally is employed to heat industrial areas. This one and several others heated giant Ford engine plant under construction in the dead of winter. Unit and two 250-gal oil tanks mounted on skids for portability.



HEAT FOR THE MIX in ample amount is assured by Littleford torch-type burner using kerosene from a convenient tank. Universal bracket permits mounting anywhere.

lb model which can be carried around like a piece of luggage. It is rated at 100,000 Btu, has a fan throwing 600 cfm. A completely self-contained model is the Chinook Wind Airliner model. It is mounted on four tires for easy towing, carries three LPG bottles and has a gas engine-driven generator to furnish electricity (engine uses LP gas for fuel). It was designed, with ducts, chiefly for

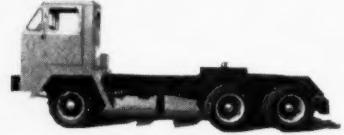
preheating of aircraft but has found its way into construction operations. Safety automatic shut-offs and thermostatic controls are available. It is rated at 350,000 Btu at 2,000 cfm, temperature rise of 200 deg.

• **Oil-burning direct-fired units** are made in several sizes by the Master Vibrator Co. Its Master

(Continued on page 72)

Differential Lock-out Gives New Bantam Crane Carrier Six-Wheel Drive Advantages

Continuing its purpose of producing a single sized machine, Schield Bantam now answers the large contractor's demand for an all-new truck mounting by offering its brand-new crane carrier.



This brand new Bantam mounting has been specially engineered and built by a leading truck manufacturer to bring the Bantam Owner dependable performance. A differential lockout feature brings positive drive to each of the four drive wheels which job reports say compares favorably with the traction of a 6-wheel drive truck.

Heavy, wide-flange I-beams form the frame of this new excavator-crane carrier. Bolt and pin connecting out-riggers add extra stability on the job where lifting is involved. The rear axles, both driving axles, are rated at 26,000 lbs.

With a 16½-foot turning radius, the Bantam can work where many larger, more cumbersome rigs can't go.



The benefits of one-man, on-the-job operation are accomplished by installing the Bantam Remote Control system in the operator's cab. This allows operation of the Bantam crane or excavating attachment, as well as the carrier, from the operator's position in the Bantam cab. Six wide windows give the operator more than adequate visibility to both sides, front, up and down.

The new Bantam Crane Carrier is well adapted for counties, industrial use, utilities, steel erectors and state highway departments. On-the-job reports substantiate the company's claims of outstanding maneuverability and high stability.

A product sheet is available from the

SCHIELD BANTAM CO.

221 Park St., Waverly, Iowa

(Advertisement)

New *Bantam Crawler* "Digs-In Better in Hard Material Than Any Machine I've Used"

says L. A. ARMSTRONG

Charlotte, N. C. - Contractor

North Carolina Sandstone Stalls Ditcher . . .

*Two Larger Size Back Hoes . . . But the New
C-35 BANTAM Digs Over 750' of 30" x 6"
deep Trench in 8 Hours!*

ON A MAJOR SEWER EXTENSION and improvement project for the City of Charlotte, N. Car., L. A. Armstrong, Charlotte Contractor, found his new C-35 Bantam Back Hoe was the only one of 4 machines that would load-out sandstone on the project!

Two makes of larger Back Hoes and a Ditcher were tried, but none could handle the tough digging . . . their buckets skimming the rain-wet surface, without digging-in. Then Armstrong tried his New C-35 Bantam! Digging sharply and easily, the Bantam's 30" bucket dug out big payloads, leaving trench sides and bottom straight and smooth without any hand trim!



Bantam digs perfect sides and bottoms without sidecutters! No need for hand trim here.

Going 6' deep in the tough sandstone, Armstrong's Bantam averaged 95 feet per hour each 8-hour day! Slick underfoot conditions caused by heavy rains

and 94° heat made the job tougher.

RECLAIMS OLD PIPE

Armstrong also used his Bantam to uncover and salvage several thousand feet of 48" cast iron pipe in Charlotte. In 20' sections, the pipe was lifted out by the Bantam with a sling attached to the Back Hoe bucket.

Despite tough digging conditions, Armstrong's C-35 Bantam used only 10 gallons of gas each 8-hour day, resulting in a low hourly operating cost.

DESIGN ELIMINATES HAND LABOR

Armstrong likes the Bantam's two-speed, independent travel feature, says he can turn it on a dime! "I can dig right up against a building with the Back Hoe and move-out to dump the dirt. Repeating the process, I can cut sewer, water and gas lines with my Bantam that would formerly have been dug by hand, and naturally the Bantam does it many times faster!"

Bantam's fast line and swing speeds, low center of gravity, and full vision cab all received praise from this owner.

"PERFECT MACHINE . . ."

"My operator can watch his grade better from the Bantam than any other machine we have used," he said. "Also, the Bantam digs in better in hard material than any other excavator I've used . . . and I've tried them all!"

PLANS BUYING 2nd BANTAM

Owner of a truck-mounted Bantam for 3½ years, and recently the new C-35 Crawler Bantam, L. A. Armstrong is plan-

ning to buy a second Crawler Bantam. He has several dump trucks working with his Bantams and finds he can use a tag-along trailer hitched behind to get the Bantam to each job quickly.



Note the Big bite of the Bantam 30" Back Hoe Bucket in this tough North Carolina sandstone.

L. A. Armstrong's story is not unusual! YOU, too, can realize the extra production and savings he reports!

WRITE TODAY FOR NEW BOOKLET

Ask for the new booklet describing the revolutionary new C-35 Crawler Bantam. It's FREE! Call your nearest Bantam Distributor. He'll gladly arrange a demonstration ON-YOUR-JOB! See for yourself why owners are so enthusiastic about the new C-35 Bantam Crawler.

Bantam mounts on crawler, crane carrier, rebuilt trucks, new trucks or your own truck.



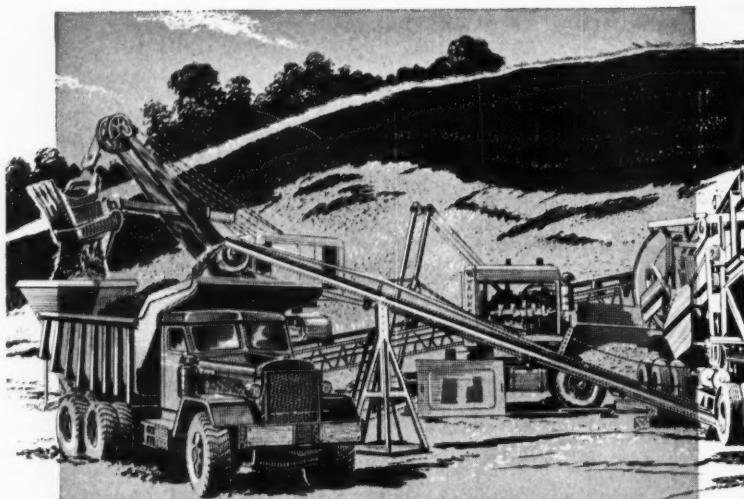
SB-CBH-4

CRAWLER OR TRUCK MOUNTED, ALL BANTAMS
AVAILABLE WITH 9 FAST-CHANGE ATTACHMENTS

- BACKHOE
- BACKFILLER
- GRAPPLE
- DRAGLINE
- CRANE
- SHOVEL
- PILEDRIVER
- MAGNET
- CLAMSHELL

WORLD'S LARGEST PRODUCERS OF TRUCK-CRANES AND EXCAVATORS





WAUKESHA

145 Series and 148 Series

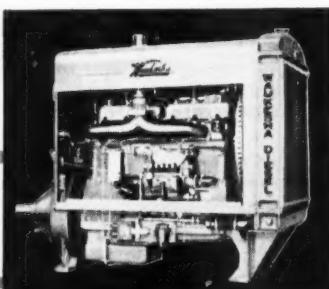
POWER UNITS

| | | |
|------------------|--|--------------------|
| 145-GKU | 779 cu.in. Medium Speed, Gasoline | 167 max. hp |
| | <i>(Standard Crankshaft)</i> | |
| 145-GKBU | 779 cu.in. High Speed, Gasoline | 178 max. hp |
| | <i>(Counterbalanced Shaft)</i> | |
| 145-GZBU | 817 cu.in. High Speed, Gasoline | 185 max. hp |
| | <i>(Counterbalanced Shaft)</i> | |
| 148-DKU | 779 cu.in. Normal Diesel | 165 max. hp |
| | <i>(Standard Crankshaft)</i> | |
| 148-DKBU | 779 cu.in. Normal Diesel | 181 max. hp |
| | <i>(Counterbalanced Shaft)</i> | |
| 148-DKBSU | 779 cu.in. Turbocharged Diesel | 250 max. hp |
| | <i>(Counterbalanced Shaft)</i> | |

• Heavy duty! That's what the 145 and 148 Series power units are for... and what they do. Here's what they have—every detail built for rough and tumble service... crankcase-cylinder block is a deep, thick-wall casting... massive, drop-forged, 7-bearing hardened crankshaft... pressued oil to every internal bearing, gear and shaft... dual spring overhead valves... cam ground, heavy-duty pistons... full length water jacket, with removable liners... and other modern features—for clean burning, high economy, lively performance and long life. Send for Bulletins.

148-DKU DIESEL UNIT

6-cylinder, 5 1/4-inch x 6-inch, 779 cubic inches, 165 hp (at 1600 rpm with standard crankshaft).



224

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

TURN ON THE HEAT . . .

Continued from page 70

portables burn kerosene or light fuel oils under pressure at a gun-type nozzle supplied by a fuel pump driven by an electric motor which also drives the blower fan. Its stainless steel combustion chamber is enclosed completely with motor, fan and controls at one end and a heat deflector at the opposite end to direct heated air, as desired.

Although Master feels that ducts generally are not required, they are available for all models. A sturdy tubular frame and two wheels support the heater, including a large-capacity fuel tank. Master portables come in three sizes, 160,000, 240,000 and 400,000 Btu; weigh 166, 250 and 311 lb (without fuel); deliver 1,100, 1,900 and 3,500 cfm; operate continuously for 12 hr without refueling. Automatic cutoffs and temperature controls are standard equipment.

• **Combination radiant and forced-air heating** is the special feature of oil-burning Silent Glow Oil Burner Corp. space heaters. Silent Glows have gun-type, pressure-atomizing oil burners such as used in domestic furnaces. Burners start with the flick of a switch and fire up inside a stainless steel combustion chamber. Combustion products are carried along in the heated air stream.

On the smallest model, most of the heat moves away laterally with only a moderate rise in temperature above the unit. It has a simple top-mounted blower to force some of the heated air to more distant areas. Larger models feature additional jacketing around the combustion chamber. This reduces the percentage of radiation somewhat, but outlets are incorporated for forced air from the blowers which can be fitted with metal duct to direct heated air to remote areas, acting as an additional radiant heating surface along the way.

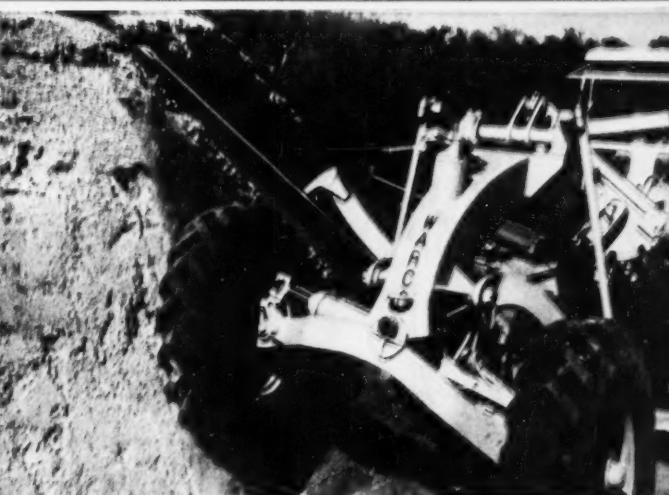
Silent Glow units all are electric-motor-operated, have integral fuel tanks and two wheels for easy portability. The larger units have fully automatic temperature control. Output is 168,000 Btu for the smallest, 350,000 for the largest. Air delivery by the blowers varies from 550 cfm to 2,400 cfm. Fuel is kerosene or light fuel oils. The smallest unit weighs 210 lb, the largest 527 lb.

(Continued on page 75)

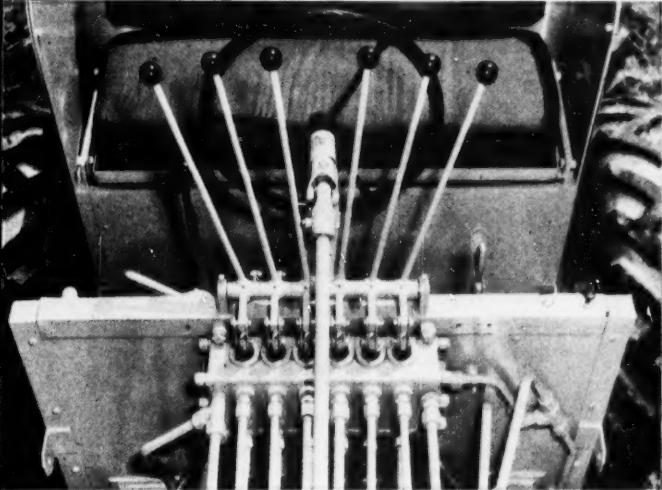
New Sundstrand Multiple Section Series Valve Controls Two or More Operations Simultaneously



Lifts, shifts blade SIMULTANEOUSLY! Sundstrand Valve permits complete cab control of blade on Warco Motor Grader—a full 180° cross shift of blade carriage from side to side—tilting, raising, or lowering of blade—two or more operations at ONE time!



Wheel lean from right to left, or back again is achieved with fingertip controls in the cab. The same Sundstrand Multiple Section Series Valve permits cab control of the scarifier—lifting or lowering at will of the operator.



Not only is shift of blade carriage controlled from cab, but the operator can lift or lower one or both ends of the blade and rotate the blade, handling two or more operations simultaneously, without loss of time.



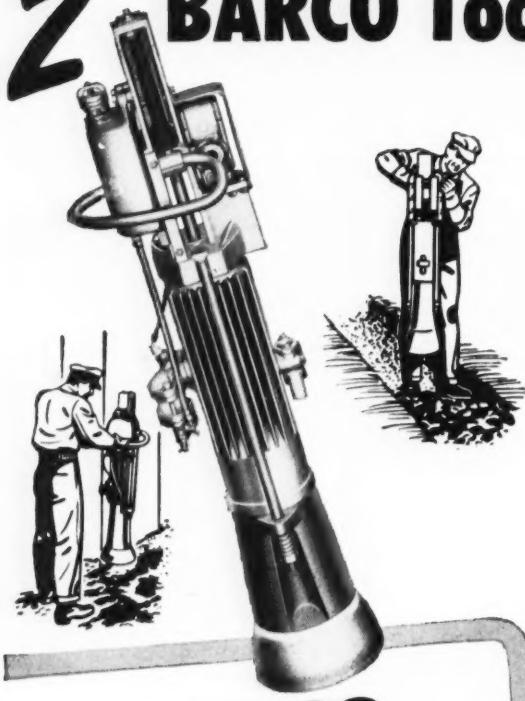
Sensitive fingertip control is absolutely essential when laying hot mix to assure a smooth, even surface. Instantaneous response of blade is assured when controlled with a Sundstrand Multiple Section Series Valve. Get bulletin 3104, on this new Sundstrand development.



SUNDSTRAND HYDRAULICS

SUNDSTRAND MACHINE TOOL CO.
HYDRAULIC DIVISION, ROCKFORD, ILL.

2 BARCO Tools with Many Uses

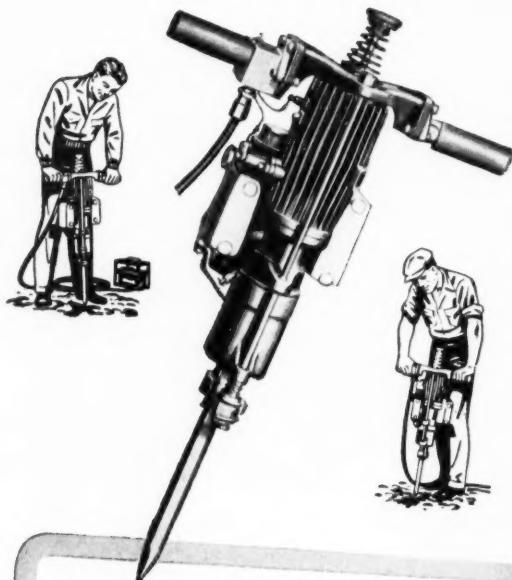


BARCO Gasoline RAMMER

■ Today, SOIL COMPACTION is the key to better construction on important projects throughout the country AND ON THESE JOBS, THE BARCO RAMMER IS THE ANSWER:

- Better work! Easy to meet specifications calling for 95% to 97.5% (modified Proctor) compaction.
- Ideal for work in restricted areas: inside buildings, close to walls, culverts, and abutments—in trenches, ditches.
- Faster compaction! 20 to 30 cu. yds. per hour—day in and day out.
- One man operation! Completely self-contained; no auxiliaries needed.
- Low operating cost. Low initial cost.
- SAFE! Simple to operate. Operators like Barco Rammers.

Send for Catalog No. 621 and bulletin, "Cost Data for Soil Compaction." See the Barco Rammer in action—ask for a demonstration.



BARCO Gasoline HAMMER

■ Here's why owners of the *improved* Barco Gasoline Hammer are enthusiastic about this "Profitable Tool With Many Uses!"

- Versatile! Use it for Pavement Breaking . . . Cutting . . . Digging . . . Rock Drilling . . . Frost Breaking . . . Rod Driving. Ideal for general utility, standby, and emergency service.
- One man operation. No compressor needed. Easy to take to any location.
- New ignition system—quick, easy starting.
- Quick disconnect at handle for battery cable. Thumb controlled switch.
- Powerful, rugged; up to 1550 strokes per minute.
- Economical! Low first cost, low operating expense, low maintenance expense. Quickly pays for itself.

ASK FOR A DEMONSTRATION
—See for yourself—ask for our nearest distributor to give you a demonstration. Catalog No. 631 on request.



BARCO Manufacturing Co.

512N Hough Street, Barrington, Illinois
Distributors Located in All Principal Cities

FREE ENTERPRISE—THE CORNERSTONE OF AMERICAN PROSPERITY

TURN ON THE HEAT . . . Continued from page 72

• **Indirect-fired portable heaters** are championed vigorously by the Herman Nelson Division of the American Air Filter Co. Herman Nelson heaters were used in great numbers during the war years to preheat aircraft engines and other military equipment. The makers since have improved their product, expanded its area of usefulness and have directed their major effort to serving construction needs.

The three models of HN portables are built around a common design. First there is a circular combustion chamber, or heat exchanger. Around this chamber is built a cabinet as a casing to guide the flow of blower-driven fresh air across the surfaces of the heat exchanger. Combustion products and heated air are kept separate by a flue manifold set into the stream

chamber pressures are below those in the surrounding cabinet.

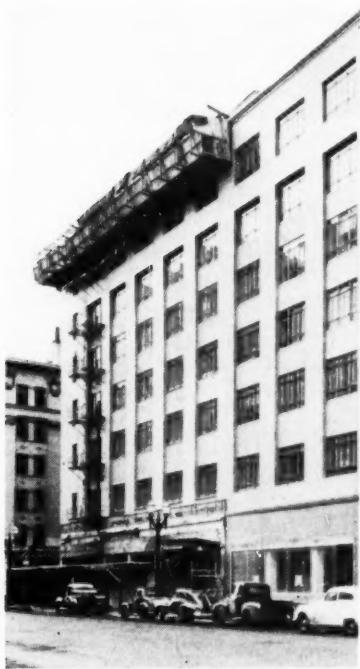
In large areas Herman Nelson heaters often are operated without flue connections to the outdoors, but the maker believes that all space heaters should be vented to atmosphere to forestall carbon monoxide poisoning. When vented outdoors, they can be used to warm—and simultaneously ventilate—tightly enclosed structures. Or, the heater can be operated outdoors and its heating ducts brought in through a wall opening.

The Herman Nelson standard model is powered by a gasoline

engine, and also uses gasoline for its heating fuel. It is completely self-contained, for standby and "go anywhere" service, supplies 250,000 to 385,000 Btu—exclusive of the heat wasted out of the flue with combustion products.

A de luxe model is electric-motor-powered, burns kerosene, operates automatically and is rated up to 450,000 Btu. An economy model—also electric-powered and burning kerosene—is rated up to 190,000 Btu. All models are mounted on wheels, have integral fuel tanks.

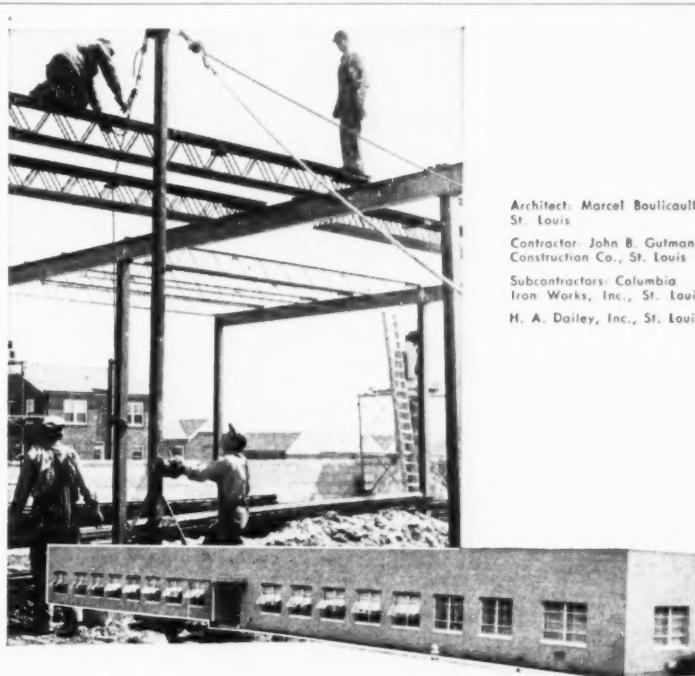
(Continued on page 78)



COVERED SCAFFOLDING encloses exterior masonry work high up on a wall. Trane Convector on scaffold got steam from building supply.

of heated air so that additional heat is taken out of the flue gases before they finally leave the stack.

The heated air leaves the cabinet via two end openings to which can be connected flexible ducts for spot heating or directing warmed air over a greater area. In the event of a leak occurring between the vented combustion products and the fresh air, flow of leaking air would be from the heated air chamber to the flue because combustion



Architect: Marcel Boulicault, St. Louis
Contractor: John B. Gutmann Construction Co., St. Louis
Subcontractors: Columbia Iron Works, Inc., St. Louis
H. A. Dailey, Inc., St. Louis

65,000 sq. ft. Building Erected in 60 Days with **LACLEDE CONSTRUCTION STEELS**

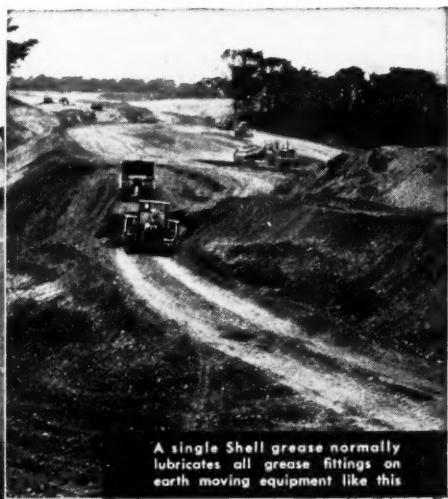
Laclede Steel service and construction know-how combined to give Ritepoint Company of St. Louis a new permanent-type building in a hurry. The short completion time resulted from using Laclede steel joists, reinforcing bars and welded wire fabric.



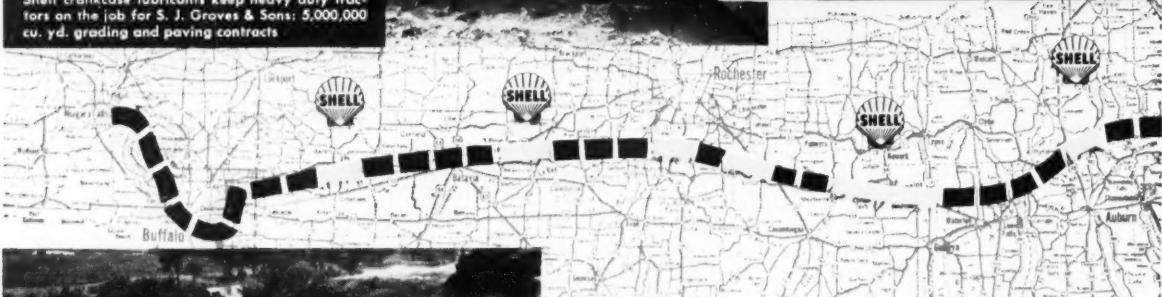
On the New York State Thruway



Shell crankcase lubricants keep heavy duty tractors on the job for S. J. Groves & Sons: 5,000,000 cu. yd. grading and paving contracts



A single Shell grease normally lubricates all grease fittings on earth moving equipment like this



Severe operation causes no motor problem with Shell Heavy Duty oil in the crankcase



Shell E. P. Gear Lubricant takes the punishment during rough going on steep grades



Arute Bros., Inc. depend upon the "stay-put" qualities of Shell's Multi-Purpose Grease for continuous heavy duty work



... 1 out of every 3 construction miles uses SHELL PRODUCTS exclusively

That's just one way of saying that Shell has been awarded contracts by companies responsible for building sections of the New York State Thruway totaling over one third of the entire mileage. And the contracts are still coming in!

Trucks, shovels, dozers, graders . . . all equipment run by gasoline or diesel engines on those

long stretches of highway construction . . . benefit from the outstanding performance of Shell heavy duty lubricants.

Products that can win the unqualified preference of such responsible and efficient operators must have what it takes . . . and Shell products *have* it . . . plenty!

Most popular on the Thruway, and equally popular wherever heavy duty engines operate, Shell lubricants keep on protecting, defying wear, and keeping maintenance costs at rock bottom. Why not specify Shell for your equipment?



SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, N. Y.
100 BUSH STREET, SAN FRANCISCO 6, CALIF.



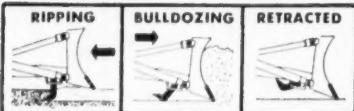


DO MORE WORK WITH
ANGLING BLADE BULLDOZERS

PRECO Back-Rippers

These four Preco Back-Rippers which are welded to the "C" frame on Caterpillar Angling Blade Bulldozers, rip up the ground while the tractor backs up—then ride on top of the ground on the forward trip. They will make money for you in pioneering, logging, mining, stripping, excavating and for push loading scrapers.

See your "Caterpillar" Dealer or write us for information.



P R E C O
INCORPORATED
6300 E. SLAUSON AVE., LOS ANGELES 22, CALIF.



This amazing new Armstrong Starter is packed with important new features — It is 50% lighter — smoother acting — easier to service and mount. The principle is based on the use of friction inside a conventional rope starter cup. Actuated by a cam principle, it engages after $\frac{1}{4}$ inch pull. Eliminates danger of teeth or pulleys breaking — permits greater tolerances in mounting. Available with stationary or rotating screen. Competitively priced.

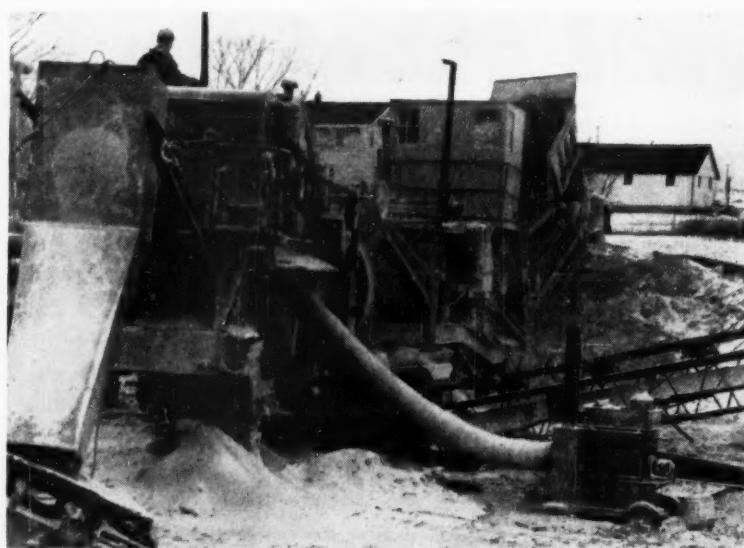
ARMSTRONG BULLDOG STARTER HERE'S HOW IT WORKS



1. Cam actuated teeth extend to grip inside of rope pulley cup.
2. Spring loading retracts teeth when pull stops.
3. Rope pulley available for hand starting in case of emergency.

If you make, sell or use products like Chainsaws • Pumps • Power Mowers • Outboard Motors, you can reduce weight — improve starting — increase starter life.

ARMSTRONG PRODUCTS CO.
Milwaukee, Wis.



DUST AND SAND SWIRL around this Herman Nelson indirect-fired portable helping out a crushing and screening operation in Janesville, Iowa. The fine screen froze over, due to wet rock, until heat was applied through a flexible duct to make an effective anti-icer.

• Large industrial heaters often become temporary heating units, especially where such units are scheduled for later installation inside a building. In such cases heating units are brought on the job during construction and put to work keeping construction workers warm.

Six Dravo Counterflo heaters (indirect-fired) were brought in during the middle of winter for construction of the big engine plant of the Ford Motor Co. in Cleveland. Units were mounted on timber skids, together with the two 250-gal oil tanks apiece, and needed only a 220-v power line for operation.

These big units blasted out from 1,500,000 to 2,000,000 Btu each through four directional nozzles. Where possible, combustion products were vented through an opening in the building roof. Elsewhere, they were discharged near the roof for thorough dissipation. The Dravo heaters operated 24 hr a day during cold snaps, were fueled directly from delivery trucks that pulled inside the huge structure.

The Trane Co. reports an unusual application of standard steam convectors. In Portland, Ore., cold weather arrived before the completion of an office building modernization job. Ceramic facing veneer for outside walls still had to be applied.

The contractor hung a covered scaffolding along a wall section to be faced, ran steam lines to several

Trane convectors mounted on the scaffolding and connected the temporary system by flexible hose to the building's heating plant.

Scaffolding was swung into place in the evening and the heat turned on. The wall section warmed up overnight, and tile was placed next day. Heat was kept on overnight for proper setting of mortar. Then the rigging was moved up 7 ft on the wall and the process repeated.

Modine Manufacturing Co. produces a line of gas-fired unit heaters usually mounted up and out of the way for industrial and institutional heating. Recently, contractors have been found using single units as temporary heat plants for construction in areas where a supply of gas and electricity to run the blower are handy.

Modine unit heaters burn natural, manufactured or LP gas; are rated in Btu from 52,000 to 132,000. Operating costs depend upon type of gas available and its cost locally. Cost will be about 20% higher when combustion products are vented outside.

Littleford Bros., Inc., is best known for its Kwik-Steam generator used widely for steam-powered operations. But these units are adapted to keep concrete plants going in cold weather and to supply heat for curing. Littleford also supplies small low-pressure and torch heaters that mount on concrete mixers and pavers for winter pouring of quality concrete, heating plaster and mortar pans and aggregates. (Continued on page 80)

Move More with a MICHIGAN



"Ease of operation is outstanding really a fine machine." — *E. E. Flomer, Supervisor, Nez Perce County, Idaho*

HERE
ARE
THE
JOB
FACTS

JOB Clean ditches, 8 miles of country road

MATERIAL Gumbo clay and hard pan

MACHINE MICHIGAN TMDT-16, shovel

OWNER Nez Perce County, Lewiston, Idaho

YARDS HANDLED 200 per day

FUEL About 2 gal. per hour

COMMENT "Air operation is amazingly easy and smooth. With Remote Control and air power, the operator does the entire job himself—everything but drive the trucks. A fine piece of equipment." E. E. Flomer, Nez Perce County Supervisor.

ONLY WITH MICHIGAN DO YOU GET ALL FIVE OF THESE COST-SAVING FEATURES—convincing proof that you get More for Your Money in a MICHIGAN!

■ MICHIGAN AIR CONTROL—operate a MICHIGAN yourself and you'll quickly see the difference. You can *feel* the smoothness of its fast swing. The MICHIGAN has *always* been air-powered, and therefore easier on the operator, faster to respond, without jerks and grabs.

■ CIRCLE GEAR and HOOK ROLLER PATHS CAST INTEGRAL—Look underneath a MICHIGAN in action and see this heavy alloy steel casting—impressive proof of rugged, long-lasting dependability.

■ TURNTABLE and SIDE FRAMES CAST INTEGRAL—Ordinarily you find this heavy-duty construction only in the largest shovels—MICHIGAN turntable deck, side frames and hook-roller mounting brackets are a single casting. There can't be misalignment, so a major cause of wear and replacement is eliminated.

■ CLUTCH REPLACEMENT IN MINUTES—Truly a triumph—this single-disk double-face clutch with six interchangeable segments on each face. Clutch relining, once a slow and costly business, is now a matter of minutes.

■ FAR FEWER PARTS TO SERVICE—Compare MICHIGAN air control simplicity with a mechanical system's complicated linkage—toggles, rods, joints, bushings, all requiring daily greasing. Hours of "dead" time transformed to working time.

It's good buying to make your own point-by-point comparison of a MICHIGAN against other machines of equal capacity. Then you'll see why more than 60% of MICHIGANS sold are "repeat sales"—to satisfied owners who know they get More for Their Money in a MICHIGAN.

Talk to your MICHIGAN dealer—
and write for literature.

**CLARK
EQUIPMENT**

**Construction Machinery Division
CLARK EQUIPMENT COMPANY
495 Second Street
Benton Harbor, Michigan, U. S. A.**



Tuffy

Increases
DOZER ROPE
Service 3 Ways!



Specially Created **DOZER ROPE** Reel Mounted On Your Dozer

Here's how you save 3 ways. 1st, order $\frac{1}{2}$ inch Tuffy Dozer Rope on 150' reels. It is specially constructed to last longer in tough dozer service. 2nd, mount the full reel on your dozer. Feed just enough Tuffy Dozer Rope through the wedge socket to replace the few feet that gets the wear on the drum. Keep on using the undamaged part. 3rd, repeat this procedure—avoid throwing away 40 or 50 ft. of Tuffy Dozer Rope while there still is a lot of service left in it... cut your down time in half... get longer service from Tuffy, the dozer rope specially constructed for dozer service. Users report savings up to 300%.



UNION WIRE ROPE CORP.

Specialists in Wire Rope and
Braided Wire Fabric

2270 Manchester Ave., Kansas City 3, Mo.

Please send me the FREE illustrated folder
on Tuffy Dozer Rope.

Firm Name _____

By _____ Title _____

Address _____

City _____ Zone _____ State _____

C-19

Page 80 — CONSTRUCTION Methods and Equipment — December 1953

TURN ON THE HEAT . . .

Continued from page 78

Cleaver-Brooks Co. builds large steam generating equipment not suitable as portable units. But it is being applied at times on a semi-permanent basis for such work as curing of large concrete pours. At times on large concrete jobs, permanent boilers are installed shortly after construction has started and their heating capacity used to furnish the temporary heat required during construction.

Comparisons

There is no exact yardstick to compare the effectiveness of one type of portable space heater with another, chiefly because no two construction jobs ever are alike. Each job poses a different set of variables when figuring heat requirements and deciding which heater will do the job best with reasonable economy. Cost is an important factor because the contractor finds it harder to earn a profit in cold weather.



Tuffy

Saves Up to 40% on Sling Costs



"Tuffy Slings Are Easy To Work With"

Says Superintendent of a
Missouri Construction Company
(Name on Request)

Only Tuffy Slings give you the patented 9 part machine-braided wire fabric construction that resists knots and kinks... stands up longer than ordinary wire rope. Tuffy Slings can be repeatedly bent around small radii and abrupt corners. You'll find Tuffy Slings are extra flexible, extra strong — they're proof tested to twice the safe working load. Try Tuffy yourself and see the difference!



DIRECT-FIRED blower-type heater fueled with LP gas and powered by an electric motor is the Chinook Wind. Heat can be ducted.

• Salamander types are the simplest and cheapest, are small enough to be taken anywhere by one man and blaze away merrily with little attention for hours on end. They burn low-cost fuels available practically everywhere and get about the same amount of Btu's out of a gallon as the fancier models.

They are low in first cost and it is of comparatively little moment when one is damaged beyond repair. Anyone can operate them and maintain them—basically a matter of keeping them clean for full combustion efficiency.

But it must be remembered that salamanders are radiant heaters
(Continued on page 82)



UNION WIRE ROPE CORP.

Specialists in Wire Rope and
Braided Wire Fabric

2270 Manchester Ave., Kansas City 3, Mo.

Please send me the FREE Tuffy Sling
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C-20

Weston Power Plant, Rothschild, Wis.—Engineers: Pioneer Service & Engineering Co., Chicago, Ill.—Owner: Wisconsin Public Service Corporation, Milwaukee, Wis.



**WELLPOINTS
ELIMINATE
SHEETING...**

*...on power plant
foundation*

Construction costs took a nose dive when the engineers on the Weston Power Plant constructed an earth-fill cofferdam and predrained the wet excavation with a Moretrench Wellpoint System.

Confidence in the efficiency of Moretrench Equipment enabled the pumping contractor, American Dewatering Corporation, New York, to guarantee results in a limited period of time.

Three days after pumping started, 16' of water had disappeared and they were excavating "in the dry" at a considerable saving of time and money. During flood stage of the river, 25' of water were handled perfectly.

For results like this on your wet work, call our nearest office!

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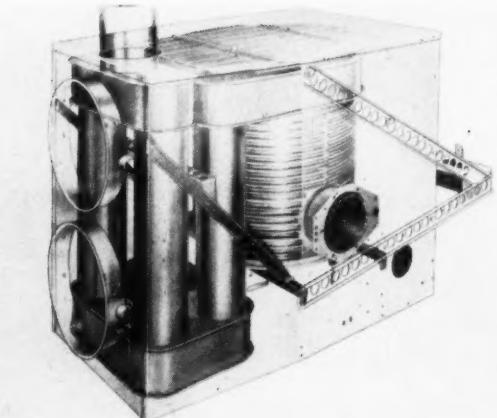
Rockaway
New Jersey



DIRECT-FIRED OIL-BURNER is The Master portable which burns kerosene or light fuel oils—carried in a supply tank underneath the heater. Deflector directs heated air as desired.

with high surface temperatures. There is little danger of workers getting burned, but there is the constant hazard of flammable materials being dropped too close and catching fire. Radiant heat waves travel in straight lines, so that it is possible to have hot spots and cold spots around an occupied area if there is no induced movement of air.

• **Direct-fired forced-air heaters** cost a good deal more than the simple salamander and they need more attention maintenance-wise. But they produce considerably more heat and blowers distribute their Btu's over a much greater area. One forced-air unit usually will equal a number of salamanders, making it easier for one person to keep his eye on it.



CIRCULAR COMBUSTION CHAMBER surrounded by cabinet as casing to guide flow of blower-driven air around it is design of Herman Nelson indirect-fired portable. Flue can be vented outdoors.

Many of these are semi-radiant types and also must be protected against contact with flammable materials. Most direct-fired heaters will receive ducts for spot placement or better distribution of heat, but the ducts must be of special material, such as flame-proofed canvas, asbestos or metal. Heater cabinets and ducts become pretty

(Continued on page 84)

5 or 6 INCH AUGERS drill up to 80 feet 4 $\frac{1}{4}$ INCH AUGERS drill to greater depths



Parmanco MODEL 51V VERTICAL DRILL HEAVY DUTY • 4 SPEEDS AND REVERSE

Here is a mobile drilling tool, built around a 40 h.p. Ford motor and to user's conditions and requirements. In use today in many fields, it is speeding and simplifying jobs.

In a recent field test an accurate sample was taken in 30 minutes thru 25 feet of overburden. This was done adjacent to an identical test hole that had taken 8 days to drill and sample by hand.

This Model 51V has four auger rotating speeds and reverse. It has proved its ability to meet the requirements of the general prospecting field where it is not necessary to drill solid limestone. This machine (Model 51WV) is also built around a Wisconsin 25 h.p. air-cooled motor, 4 speed transmission and self-starter.

PARIS MANUFACTURING CO. PARIS, ILL.

SCOOPMOBILE (Model LD10) Heavy duty front end loader. 4-wheel drive, 4-wheel planetary drive, 4-wheel power steering through exclusive center pin hinge coupling. Capacity, 1½ to 2 cu. yd. (Smaller Model LD5—capacity, 1 cu. yd.)



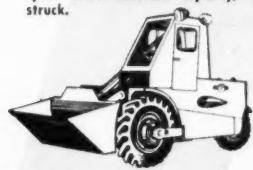
DUO-WAY SCOOP. Dozer at one end, scoop at other. Shovels, loads, transports, dozes, backfills. Four speeds either direction. (Model DS2H—capacity, 1 cu. yd. struck; Model DS3H—capacity, 1½ cu. yd. struck).



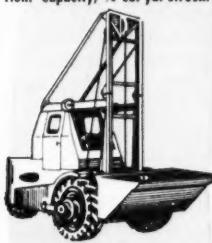
LOGGERMOBILE. (Model LG10) 4-wheel drive, 4-wheel power steering. Hydraulically operated live arch and telescoping boom. Planetary drive winch. All purpose logger—skids, arch logs, loads.



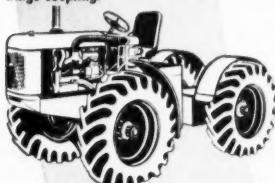
SCOOPMOBILE (Model N) Shovels, loads, transports all types of bulk materials. Four speeds either direction. Capacity, ½ cu. yd. struck.



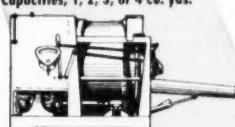
SCOOPMOBILE (Model C) Scoops, hoists, stacks and loads. Four speeds either direction. Capacity, ¾ cu. yd. struck.



TRACTORMOBILE (Model TR10) Heavy-duty, general utility tractor. 4-wheel drive, 4-wheel power steering through exclusive center pin hinge coupling.



SEMI-STATIONARY MIXERS. Concrete mixing plants. Electronic water metering, hydraulic controls. Capacities, 1, 2, 3, or 4 cu. yds.



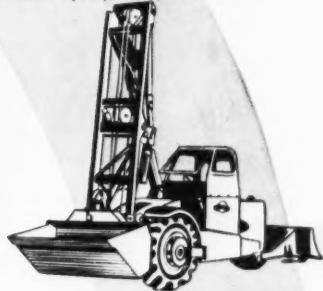
TOWERMOBILE. Mobile truck-mounted hoisting tower. 35-ft. open-faced tower raised and lowered hydraulically. Storage, 7½ cu. yd.



For descriptive literature concerning work features, job applications, special labor-saving optional attachments for all units shown above — see your nearest Mixermobile representative or write direct to the factory.



DUO-WAY SCOOP (Model DS2B) Scoop at one end, dozer at other. Side-saddle operator position. Upper track folds hydraulically for clearance. Capacity, 1 cu. yd. struck.



DUO-WAY LIFT (Model DL2B) Transporter and heavy-duty lift truck with folding track. Four speeds either direction. Capacity 12,000 lbs. (two part line).



DOZERMOBILE (Model DM1) Powerful, high-production tractor-dozer. 4-wheel drive, 4-wheel power steering through exclusive center pin hinge coupling.



MIXERMOBILE (Model M7) Highly mobile concrete mixing and elevating plant. Electronic water meter, batch timer, power divider transmission case. One man can mix and elevate approximately 30 cu. yds. per hour. 2 cu. yd. mixing drum and 45' tower.



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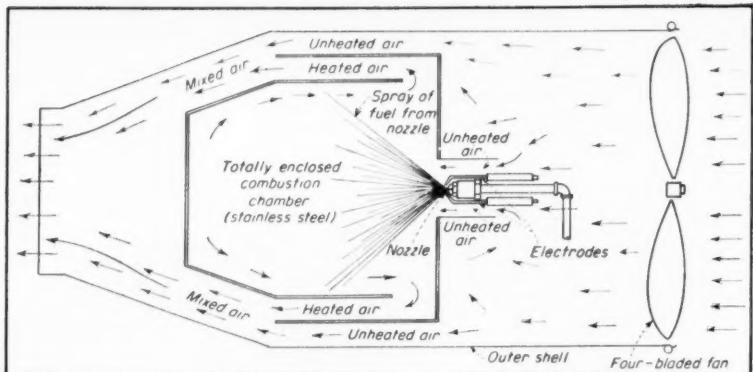
"THIS LUBRICANT CUT OVERHAULS IN HALF".

—says WESTERN AUTO TRANSPORTS, INC.

"Operating over 200 tractors and 200 trailers from Detroit to the West Coast, we encounter temperatures from 120° above across the desert to 40° below in the mountains of Colorado. We have found that with LUBRIPLATE our wheel bearing packing mileage has tripled. Since using Lubriplate A.P.G.-90 in our transmissions and differentials, we are getting double the mileage between their overhauls."

For nearest LUBRIPLATE distributor, see Classified Telephone Directory. Send for free 56-page "LUBRIPLATE DATA BOOK", a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.

REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE COSTS.



AIR FLOW THROUGH HEATER diagrammed schematically for the Master direct-fired unit which sends combustion products with the air, mixes all thoroughly and blows them out of the business end. Combustion chambers of typical portable heaters are stainless steel.

hot, must be respected accordingly.

• **Indirect-fired forced-air heaters** are the most expensive initially. But they produce the cleanest heat, can be used to ventilate while heating. Ducts can be a simple flexible canvas because the cabinet temperature is moderate and the heated air delivered through them probably runs at a temperature under 250 deg. There is some loss of heating efficiency here because up to 35% of the heat value of the fuel burned may go out the flue with products of combustion.

Maintenance is not great but what there is requires more skill than with the simpler space heaters. (Maybe another question for construction unions: Who shall operate temporary heaters?) Indirect firing and ducted heat make it an ideal machine to be operated outdoors while heating inside areas with ducts feeding through wall openings. This type is popular for pre-heating engines on construction machinery before operating.

• **Products of combustion** from temporary heaters used indoors can be a distinct hazard to human beings. Simple salamanders and direct-fired heaters mix their heated air and combustion products. Indirect-fired heaters exhaust combustion products outside the working area, unless the operator neglects to install a flue connection.

Unvented heat units are employed regularly with great success and manufacturers insist that the infinitesimal small amount of harmful matter scattered through a large volume of heated air will hurt no one. And they have been proved correct by impartial testing laboratories—so long as the burner is maintained well and works like new.

In addition to smoke and fumes from an improperly operating unit, there is the greatly increased danger from carbon monoxide. Different persons react variously to CO but it has a cumulative effect (doesn't pass out of the human system easily) and the "headache warning" and nausea symptoms may be too late. The sensible way is to provide ample venting of occupied areas. Use a vented indirect-fired heater if in doubt.

Heaters are fired up variously, from using a lighted match to the flick of a switch. Controls range from simple manual adjustments and shutoffs to thermostatic temperature regulators, and automatic fuel and ignition shutoffs in case of fuel, air or power failures.

• **The fire hazard** can be very real with any type of temporary heater in the hands of a careless operator. Conversely, all types can be set up to eliminate every conceivable hazard. It all depends upon the human element in charge. But remember to check city ordinances and fire regulations. Some of the larger cities have specific rules concerning the use of temporary space heaters, and it is wise to check particularly on the section covering "occupied structures" when working in such areas.

Although a manufacturer may brand a fuel he is not using in his heater as "dangerous," all fuels are entirely safe when handled properly. Gasoline and gas, for instance, long have been respected for their ferocity when misused. But they are quite docile when used properly in domestic service by millions daily.

Under no circumstances should a heater be refueled unless it is shut (Continued on page 87)

100's
JOE'S



ABRASIVES

Any masonry material can be cut in seconds with either a "WET" or "DRY" specification. New type Clipper Abrasive Blades approach the cutting speed of diamonds.

CLIPPER DIAMOND

No other means of masonry or concrete cutting can equal the cutting speed of a Clipper Diamond Blade. Only Clipper has every necessary specification to do your cutting job.

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Break-Resistant
Drop-Bend-Twist—they're virtually unbreakable! 50% to 100% longer blade life on softer ranges of materials. Ideal for both masonry and hand power saws.

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Clipper Superior Blades are guaranteed to . . . "Provide the Fastest Cut at the Lowest Cost!"

MODEL C-130
ONE OF 5 MODELS
GAS OR ELECTRIC
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15 MODELS
PRICED FROM
\$265



Clipper Superior Blades are manufactured under rigid control . . . assuring consistent quality. You are guaranteed peak performance . . . at the lowest possible cost with every blade.



CLIPPER BLADES to fit Every Make and Model Masonry — Concrete — Hand Power Saw

Your guarantee of the finest, fastest, most economical masonry and concrete cutting is the familiar Clipper Trade Mark on a Wet Abrasive — Dry Abrasive — "CBR" (Break-Resistant) — or a Diamond Blade.

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Genuine
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The unqualified Clipper guarantee of satisfaction is backed by nearly 20 years of world-wide experience, the ability to select the finest materials and the "know-how" to put them together.

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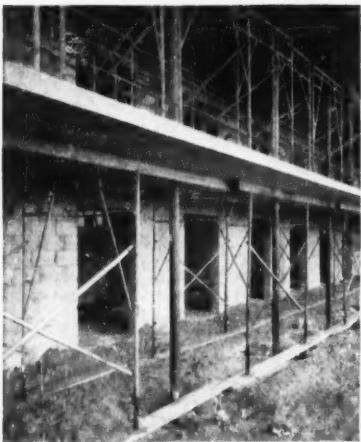
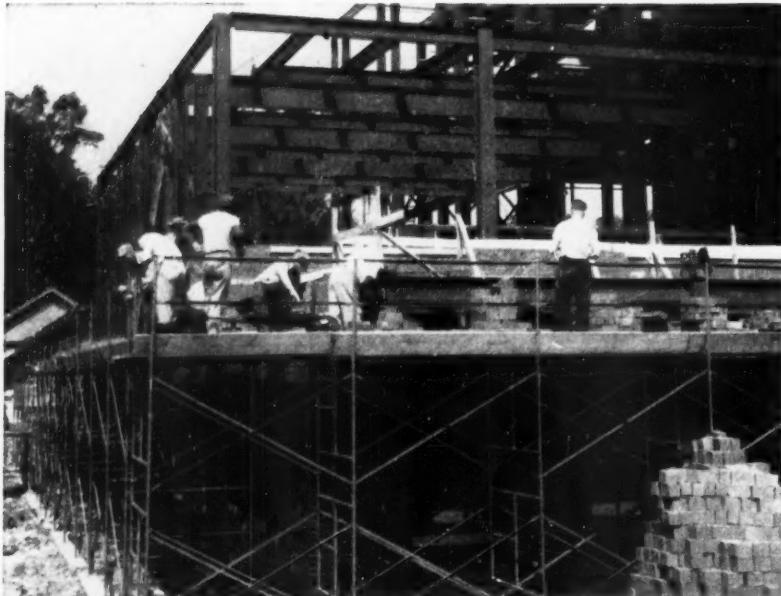
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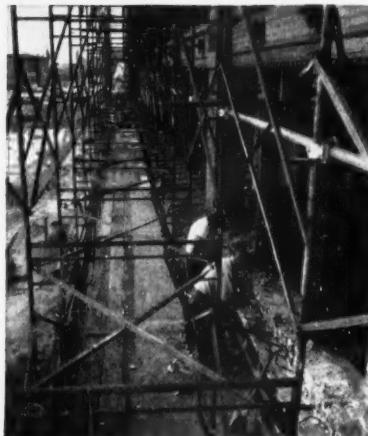
(Advertisement)

"TROUBLE SAVER"® Sectional Scaffolding at Work Around the U. S.



MIAMI SHORES—

For the Blue Horizon Hotel's new cabanas, Florida contractor Morris Burk cut concrete shoring costs by using "Trouble Saver" Sectional Scaffolding and I-beams set directly on scaffolding frames. Plywood panels were laid on I-beams without fastening. The new technique eliminates framing, also ends stripping. "Trouble Saver" Scaffold used: 52 5x5-ft deep-trussed end frames, 20 6 1/2-ft shallow-trussed end frames, 72 6 1/2-ft deep-trussed end frames, 288 plain bases, 288 20-in. adjustable extension legs; 120 5-in. I-beams.

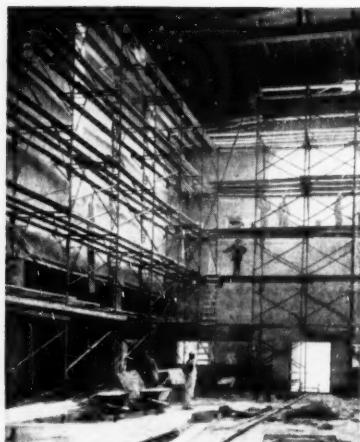


RENOVATION IN ILLINOIS—

Removal of old cornices, installation of new stone copings and a new synthetic granite front, replacing of windows and painting the upper floors of the 8-story building at 12-22 North Michigan Ave., Chicago, required this big "Trouble Saver" Scaffold. To erect the 92-ft high scaffold, The Patent Scaffolding Co.'s Chicago office supplied 315 pre-fabricated scaffold frames to Enjay Construction Company. Here workmen are removing the old cornice preparatory to installing a simple stone coping.

NEW YORK MASONs

work on new power plant building at the State Hospital in Middletown, N. Y. L. B. Strandberg and Sons Co., Inc., Chicago general contractor, purchased the "Trouble Saver" Sectional Steel Scaffolding used on this job. The 5-ft high mason-type frames shown here in use are designed to provide a convenient, multi-level scaffold with a maximum number of sidewall bracket positions for masons' use. "Trouble Saver" Scaffolding, described in free Bulletin PSS-24, is one of the many types of scaffolding offered by PS Co.—the only complete line for every job, big or small. Be sure of the right equipment for your job—follow the practice of experienced contractors and—when it comes to scaffolding, come to PS.



PORTLAND PLASTER

contractors Cann & Gray rented this five-level "Trouble Saver" Sectional Steel Scaffolding structure to safely speed plastering of a new church at S. E. 18th and Division Streets in Portland, Ore. This "Trouble Saver" assembly employed shallow-trussed end frames, 6 1/2 ft high, giving workmen ample headroom when walking along the scaffold platforms. Also note the "Trouble Saver" Scaffolding sidewall brackets, employed here for extra platform working area for plasterers.

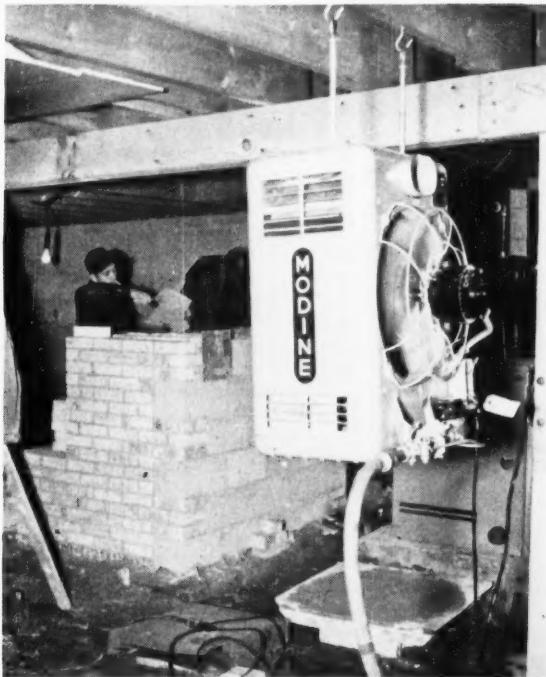
To help you solve any scaffolding problem, PS offers a complete nation-wide engineering service—available locally. See the Yellow Pages in your 'phone book for the nearest Patent Scaffolding office or representative handling "Gold Medal" Scaffolds.

FOR GREATER SAFETY...EFFICIENCY...ECONOMY

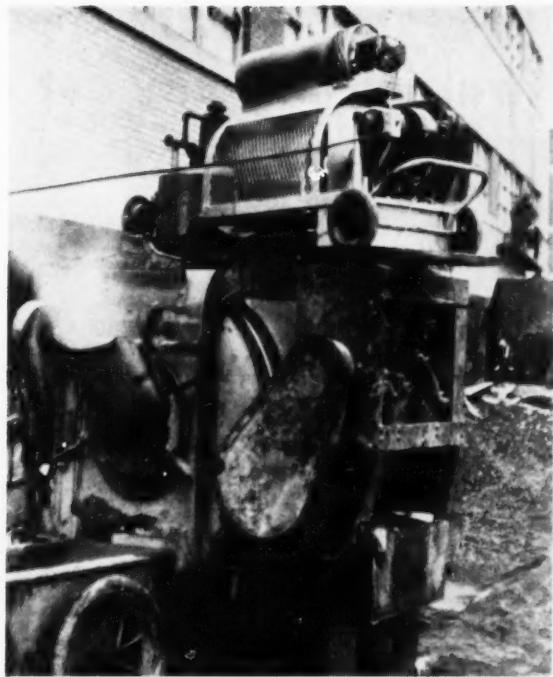


THE PATENT SCAFFOLDING CO., INC.

38-21 12th Street Dept. CM&E Long Island City 1, N. Y.
West Coast: 6931 Stanford Ave., Los Angeles 1, Calif.
Branches in all principal cities



GAS-FIRED UNIT HEATER, associated normally with industrial and commercial room heating, is applied successfully to speed winter construction. Only requirements for Modine are gas (any type) and electrical connections. Can be mounted on a floor stand.



PIGGY-BACK ON A MORTAR MIXER, Silent Glow direct-fired radiant portable keeps batches hot enough to send steam out of mixer. During bricklaying in freezing weather, building inspector specified hot water. Simple heater installation did the trick.

(Continued on next page)

GET FAST DUAL PRIMING—
DEPENDABLE LONG LIFE OPERATION—
and KING SIZE in VALUE!

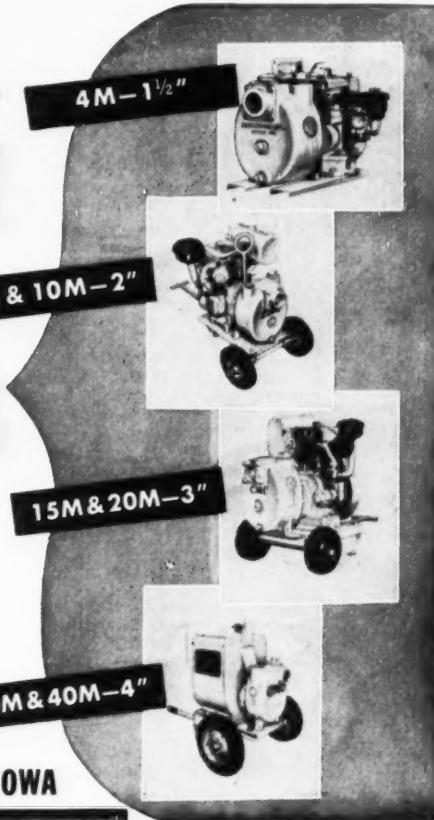


DUAL PRIMERS

Completely New Dual Prime Pump Line Featuring

- Faster Dual Volute Priming
- Self Cleaning Case
- Lighter Weight—Easier to Move
- Unpacked Long Life Seal
- Half the Parts—Easier to Service
- Unitized Construction—Trouble Free Operation

CONSTRUCTION MACHINERY COMPANY • WATERLOO, IOWA



Jaeger "air plus" puts full wallop into any set of tools



EXAMPLE: Jaeger was first to replace 105 ft. compressors with the 125 ft. size which holds 90-100 lbs. pressure in 2 heavy paving breakers instead of weak 70 lbs. At this full pressure, the same men and tools do 30% to 40% more work.

75 ft. Comparable increases in production are obtained with all 6 Jaeger "new standard" ratings. Their performance has been proved-in-use by thousands of units in the field. First cost and operating cost, per cu. ft. of 100 lb. air, is far below any "old standard" size machine.

See your Jaeger distributor or write for Catalog JC-1.

THE JAEGER MACHINE COMPANY

800 Dublin Avenue
Columbus 16, Ohio

LOADERS • PUMPS • MIXERS • TRUCK MIXERS • PAVING MACHINES



"WITH A LEVELALL

I CAN DO THE WORK OF TWO MEN AND A TRANSIT!"

Any workman can handle any leveling job with 100% accuracy . . . and do speedily and easily, all by himself. For LEVELALL is a 75' transparent plastic tube with shut-off valves, mounting brackets and filled with a special anti-freeze liquid. And here's how it works: fasten tube brackets to forms, batter-boards, etc., snap open the valves and the liquid gives two accurately level points. The job is level . . . no doubt about it.

LEVELALL is an investment, a time-saving, cost-saving precision instrument at the extraordinarily low cost of only \$12.95.

Start leveling your costs by sending for "On the Level," a free booklet aimed to help solve your leveling headaches . . . or ask us to send your LEVELALL post-paid immediately.

Money-back satisfaction guaranteed. Dealer inquiries welcome.

LEVELALL, 95N Webster St., Rockland, Mass.

Please send free booklet, "On the Level" Mail me Deluxe LEVELALL @ \$12.95 Regular 50' model at \$9.95 Ship post; aid full price enclosed.
 Ship C.O.D.

Name _____

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[In Canada, prices slightly higher; write
LEVELALL, INC., 5465 Decarie Blvd., Montreal, Que.]

TURN ON THE HEAT . . .

Continued from page 87

down completely and has had a chance to cool. Also, do not store fuel near an operating unit. It is only common sense to keep all safety cutoffs and controls in first-class condition.

Portable space heaters have not yet received Fire Underwriters' approval. It is a relatively new industry and a study is under way regarding standards. Certain elements, such as safety controls, burners and pumps may be approved items, but no complete unit has received approval. At least one manufacturer is trying to obtain such approval on his forced-air units.

Concerning fire extinguishers kept around temporary heaters: Do not expect water to control oil fires. CO₂ and dry chemical extinguishers are effective.

• **Claims and counter claims** keep flying. The maker of a low-priced salamander will point to heat output versus fuel consumed and flexibility of use. He may profess to come to the conclusion that a forced-air heater is pretty much of a luxury. The manufacturer of blower units claims equal flexibility and versatility and insists that heat must not only be produced but also placed where it will do the most good for real job efficiency.

There is no industry association to set standards such as exist for "AGC-rated pumps." So the battle goes on. Will a number of salamanders replace one forced-air unit, or is it better vice versa? Is equipment cost per 100,000 Btu a fair comparison? Is fuel cost per 100,000 Btu a better approach?

The accompanying table gives one type of comparison for the better models of each type of portable space heater. It throws light on the subject of costs for heat produced but makes no mention of some important variables that must be considered for a complete analysis of major types. However, it is useful and credit goes to R. P. Lion, Stilcon Sales Corp., Long Island City, N. Y., for this valuable contribution.

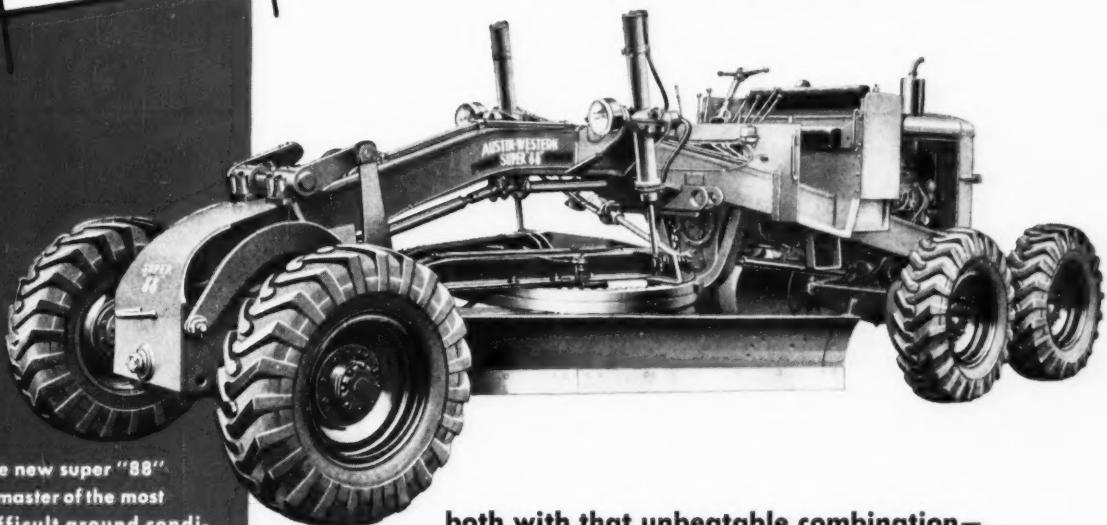
• **Go to your distributor** for help in figuring your needs and the number of portable space heaters you should acquire to serve them. Some manufacturers supply handy forms to figure job heating needs
(Continued on page 90)

NOW

AUSTIN-WESTERN offers you your **CHOICE** of

6-WHEEL and 4-WHEEL GRADERS

in the popular "88" series



The new super "88" is master of the most difficult ground conditions. Four driving, steerable wheels at the rear team up with the live, climbing power of Austin-Western's famous front truck to provide flotation no ordinary motor grader can hope to equal.

both with that unbeatable combination—

ALL-WHEEL DRIVE and ALL-WHEEL STEER

Whatever the job . . . whatever the ground condition . . . your best buy among machines of medium size is an Austin-Western Power Grader of the "88" Series. With exclusive All-Wheel Drive for 30% greater Power-at-the-Blade; exclusive All-Wheel Steer for 100% greater Maneuverability, and exclusive "swing that rear-end" Controlled Traction for moving more material, farther and faster, the "88-H" Power Grader, with its four driving wheels (4x4), and the new Super "88" Power Grader, with its six driving wheels (6x6), will OUTPERFORM ordinary rear drive, front steer motor graders, definitely and completely.



4-wheel . . . or 6-wheel

Choose the model that's best for **YOU!**

Ask your Austin-Western distributor.

Austin-Western
Power Graders • Motor Sweepers
Road Rollers • Hydraulic Cranes

Construction Equipment Division



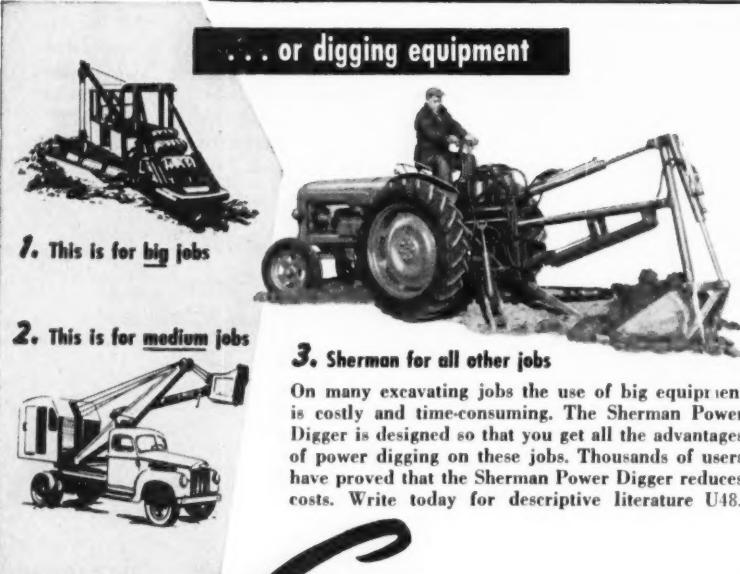
Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

CAPACITIES AND COSTS FOR TYPICAL PORTABLE HEATERS

| | Oil-Burning Salamander | LP Gas Salamander | Forced Air Heater "A"** | Forced Air Heater "B"*** | LP Gas Forced Air Heater |
|---------------------------|---------------------------|----------------------|----------------------------|-----------------------------|-----------------------------|
| Unit Cost | \$20 | \$30 | \$825 | \$500 | \$200 |
| Type Fuel | Kerosene | LP Gas | Kerosene | Kerosene | LP Gas |
| Heat Output per hr | 140,000 Btu | 43,000 Btu | 450,000 Btu | 300,000 Btu | 430,000 Btu |
| Fuel Burning Rate | 1 gal hr | 2 lb hr | 3.25 gal hr | 2.17 gal hr | 20 lb hr |
| Fuel Cost | .15 gal | .085 lb | .15 gal | .15 gal | .085 lb |
| Fuel Cost per hr | .15 | .17 | .4875 | .3255 | 1.70 |
| Fuel Cost per 100,000 Btu | .107 | .395 | .1083 | .1085 | .34 |

*Non-contaminating type designed for separation and disposal of objectionable products of combustion such as smoke, soot, odor and gases.

**Radiant type, open flame



Designed, Engineered and
Manufactured Jointly by
SHERMAN PRODUCTS, Inc.
Royal Oak, Michigan

WAIN-ROY CORPORATION
Hubbardston, Mass.

Patent No. 2,303,825
Other patents pending

Sherman
PRODUCTS, INC.
ROYAL OAK, MICHIGAN

Sherman GP Products

on the spot. Ask your man for this assistance.

Remember that dealers offer machines on a rental basis also. This may be your best bet—at least until you have enough experience with several types of space heaters to know what to expect from them.

**Glenway W. Maxon and
J. Rich Steers to get
MOLES AWARDS**

THE INDUSTRY'S highest honors—The Moles Awards for Outstanding Achievement in Construction—will go in 1954 to Glenway W. Maxon and J. Rich Steers, presidents of Maxon Construction Co. (Dayton, Ohio) and J. Rich Steers Inc. (New York City). The awards are given annually by The Moles, a New York association of leaders in the construction industry.

Maxon, a past president of the Associated General Contractors of America, has handled jobs from the Atlantic Coast to the island of Guam, and from the Great Lakes to the Gulf of Mexico. The work has included dams, locks, bridges and defense plants. Maxon's Moles citation makes special mention of his bonus and profit sharing plans for Maxon employees.

Steers has been prominent in building such waterfront improvements as piers, wharves, drydocks, bridge foundations and shipways. Recent Steers work overseas includes a naval base in Morocco, a radio station in Tangier, an air base in Libya, and reconstruction of the Corinth Canal and three main harbors in Greece.

WHERE EXPLOSIVES RESEARCH PAYS OFF



To blast 305,000,000 tons of stone and non-metal materials for America's ever-growing construction, road building, and steel industries requires more than 166,000,000 pounds of dynamite annually. Here, as illustrated above, is where explosives research pays off. Note the excellent fragmentation which minimizes secondary blasting . . . the low stone pile which increases and speeds up the production of the shovels.

Such results come not only from specially devel-

oped explosives and blasting supplies, but also by using the most modern blasting methods. Hercules' continuous research and extensive knowledge of field conditions are important to economical and efficient blasting in quarrying, coal mining, metal mining, and construction.

HERCULES POWDER COMPANY

*Explosives Department, 974 Market St., Wilmington 99, Del.
Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.;
Joplin, Mo.; Los Angeles, Cal.; New York, N. Y.; Pittsburgh, Pa.;
Salt Lake City, Utah; San Francisco, Cal.*

A UNIVERSAL production report to crushing plant operators

| | |
|---------------------|--|
| Plant Site | Herington, Kansas |
| Operators | Anderson-Oxandale |
| Requirements | High tonnage of aggregate to meet state's exacting specification. Frequent moves and changes in product specification required. |
| Equipment | Universal 3240 Impact Master. Universal portable screening and blending unit. |
| Type of rock | Dolomite limestone. |
| Production | Currently they are meeting a difficult specification calling for a large percentage of minus $\frac{1}{4}$ inch. They are producing up to 150 yards per hour of which 100% passes a one inch screen, 90% passes a $\frac{3}{4}$ inch screen, 50-60% passes a $\frac{1}{4}$ inch screen. When desired Anderson-Oxandale can reduce the production of minus $\frac{1}{4}$ inch material by at least 50%. |



Anderson — Oxandale's portable 3240 Impact Master, crushing, screening, blending and loading plant operating near Herington, Kansas.

Anderson — Oxandale had to have a crushing plant that could be moved frequently with a minimum of down time, produce high tonnages of top-quality aggregate at each set-up, and meet exacting specifications. The Universal Impact Master (portable) with *Controlled Impact Action* combined with Universal's portable screening and blending unit was the answer.

The Impact Master, with *Controlled Impact Action* gives you four important advantages: (1) Greater control of the finished size of your material. (2) Cleaner, more cubical aggregate. (3) Lower operating cost — it requires less horsepower per ton. (4) Lower maintenance cost.

What Is *Controlled Impact Action*?

Control point 1: Controlled feed chutes the rock into the unobstructed path of the first rotor ham-

mer circle for terrific impact, providing maximum unobstructed penetration. The angle of the plate can be quickly changed to handle rock of different size and density and meet varying quarry conditions. Incoming material penetrates the first rotor hammer circle at the correct angle for efficient breaking. **Control point 2:** you control the range of sizes by simply regulating the speed of the rotor hammers. **Control point 3:** you can easily adjust the stripper bar and lower screen grate to get the percentage of sizes you want.

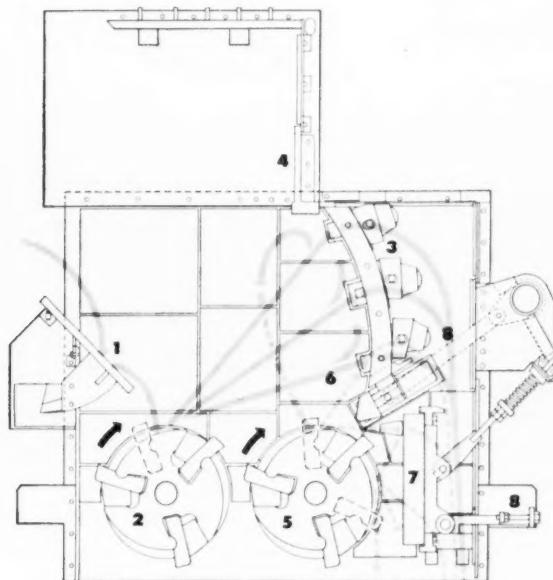
With these three methods of control, you get what you want. It's no hit or miss proposition. "*Controlled Impact Action*" is more than a phrase with Universal. It's the key to the way all Universal Impact Masters produce more aggregate of higher quality to exact specification at lower cost.



Portable 3240 Impact Master with 3 speed transmission drive from diesel power mounted to the side. Slide mounted 36" x 16'-0" portable apron feeder. Eighteen inch closed circuit return conveyor from portable screening unit. 30" delivery conveyor to portable screening unit.



Universal portable screening and blending unit. All electric driven with 5' x 14' 3 deck inclined gyrating screen equipped with ball tray. Two 30" forward delivery conveyors and one 18" side delivery conveyor. Positive blending chutes with gates control different aggregate specifications. 18" return conveyor to Impact Master.



1. Adjustable feed plate
2. First rotor hammer
3. Deflector screen grate
4. Feed chute backplate
5. Second rotor hammer
6. Stripper bar
7. Bottom screen grate
8. Adjustments

How the Universal Impact Master works:

The diagram at left shows the flow of material. Adjustable feed (1) chutes the incoming rock into the first rotor hammer circle at proper angle. Rock is hit in motion, exploded into cubical shaped pieces by terrific impact of the rotor hammers, and at the same time hurled toward the deflector screen grate (3) where finished sizes are immediately discharged. Oversize particles are deflected upward, hit the feed chute back plate (4) and drop down into the path of the second rotor hammer circle (5) where they are reduced by impact and projected toward the bottom half of the deflector screen grate and the lower screen grate for immediate discharge. Both rotor hammers rotate toward the discharge opening. Material always flows rapidly in one direction. No grates, screens or bars obstruct the discharge opening. Large expansion chamber is also completely free of obstructions. All breaking is done by impact. There is no attrition, abrasive or grinding action. Thus wear is kept to a minimum.

More and more operators are turning to the Universal Impact Master, with "Controlled Impact Action." Its high production capacity, excellent performance, and simplicity of construction just naturally results in a more efficient, more profitable operation. Tonnages up to 750 tons per hour. Available in sizes: 3240, 3645, 4250 and 5260. Write for complete information today.

UNIVERSAL ENGINEERING CORPORATION

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ORIGINAL FAME FOR QUALITY CRUSHERS SINCE 1906



Soaring to New Heights in Truck Mixer Design!



DELUXE
MODEL

SMITH Scores Another First

Smith was the *first* high discharge truck mixer . . . *first* to eliminate the need for hoist or ramp . . . *first* with a controlled discharge . . . *first* to provide visible mixing . . . *first* with feed chute charging . . . *first* to announce fluid drive as standard equipment . . . *first* with LOAD-LIMIT models. And now, Smith is *first* to come out with a

New 2-Speed Transmission Built to Aircraft Specifications

You know Smith-Mobiles have always had smooth-running, dependable transmissions. Now — the new De Luxe Model Smith-Mobile has a *2-speed* transmission, even more dependable and as smooth-running as a watch. You can drive the drum at $2\frac{1}{2}$ R.P.M. with no laboring of the engine and no surging. Or, you can run it as fast as you want. This new transmission is built to aircraft tolerances. It has Helical cut, heat-treated gears in a rugged, cast case . . . yet it is several hundred pounds lighter. The enclosed, multiple disc clutches run in a bath of oil.

The new De Luxe Model was completely redesigned for even greater efficiency. Gross weight is cut nearly 800 lbs. The overall length is much shorter. Better weight distribution allows bigger legal payloads. And it has the most accessible engine of any truck mixer on the market. All this, without any increase in price. Get the facts. Ask your Smith distributor for literature.

THE T. L. SMITH COMPANY

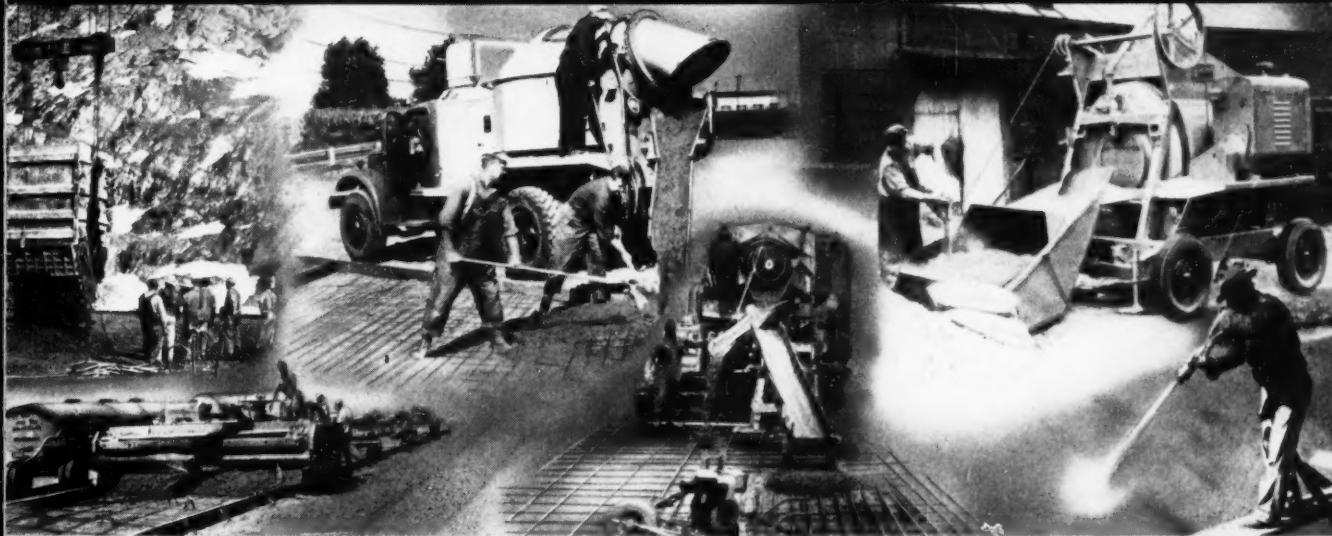
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CONCRETE MIXERS

For BIGGER and BETTER Concrete Mixers and Truck Mixers . . . LOOK TO SMITH

CONCRETE MIXING AND PLACING



3. Weighbeam and Dial Scales

By THEODORE B. APPEL, Jr., Chief Engineer, The C. S. Johnson Co., Subsidiary Koehring Co.

BATCHER SCALES mostly use the principle of the beam scale, like the common steelyard, with the pivot near one end to permit balancing a heavy weight by a small known weight. Some quite recent—but not yet generally accepted—scales use electronic and pneumatic systems.

• **Spring-type scales** were used when the change was made from volumetric to gravimetric proportioning. They depend on the principle that the stretch of a spring is proportional to the load applied, within certain limits. Sometimes they were not much more reliable than a fisherman's story of his catch. Spring-type scales do not merit further comment even though some are still in use today.

• **Batcher scale lever systems** typically have the weigh hopper suspended by four hanger rods, carried by four pivots or knife edges, two on each of the collecting levers. These collecting levers are sometimes known as rocker arms. The weight of the hopper and its contents, reduced in accordance

with the ratio of the collecting levers, is applied to the second lever in the system. Again the load is transmitted to the next lever at a reduced value as per the ratio of the second lever. The entire assembly is simply a series of steelyards.

The collecting levers do not look too much like simple levers, but they are. Referring to the collecting lever on the left in *Fig. 1* (p. 97), the front bar is a simple lever pivoted about point **B** with the weight or pull of a part of the hopper applied at point **A** balanced by a lesser pull at point **C**. The short back bar is pivoted about point **E** and the hopper pull at **D** would cause rotation of the bar about point **E** were it not also balanced by a lesser pull at point **C**.

The two bars are connected by a tube so that they act as one. This tube is known as a torque tube. The front and back bars and the torque tube act together so that the loads at **A** and **D** both are balanced by a load or pull at **C**. At **C** the pulls of the right and left side assemblies are collected and exert their combined pull on the second lever.

Let us assume that the hopper

empty weighs W pounds and the ratio of each of the collecting levers is 5, the 2nd lever is 4, and the 3rd lever is 5. The ratio of the lever system is then $5 \times 4 \times 5$, or 100. The pull which must be applied at point **H** to balance the weight of the empty hopper will be the weight W divided by the lever system ratio.

The pull which must be applied at this same point to balance the weight of the hopper and 500 lb of material in that hopper would be $W - 500$ over $100 + 100$ or 100 .

part of the pull is balanced out by a special weight on a tare beam in the beam box if the scale is a weight-beam scale, or by a similar beam and weight, generally called a shelf beam, if the scale is a dial-type scale.

The rest of the pull, 5 lb, is balanced by the poise weight of the weigh beam or the pendulum weights of the dial. It is this part of the pull that gives the weight indication desired.

• **A tare beam** is shown in a typi-
(Continued on page 97)

acids
oil
butane
gasoline
air
grease
water
acetylene
propane



One hose handles them all!

VERSICON, Thermoid's versatile, all-purpose hose, handles virtually any type of gas or liquid . . . makes stocks of many different types of hose unnecessary. You save through reduced inventories, simplified buying and less storage space. Losses from end remnants are greatly reduced.

VERSICON Hose is built to last. Synthetic oil-proof tube is reinforced with braided, high-tensile rayon. Tough oil-proof cover resists weather and abrasion.

For quick, easy identification, VERSICON has a brown cover. It's available in sizes from $\frac{3}{16}$ " to $1\frac{1}{2}$ " in lengths to fit your requirements.

In addition to various kinds of multi-purpose hose, Thermoid makes hose for certain specific applications, such as paint spray, suction, creamery, etc. Call your Thermoid Distributor. He can supply you with the Thermoid Hose best suited for your requirements. Or write direct for Catalog No. 3680.



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Rubber Sheet Packings • Molded Products
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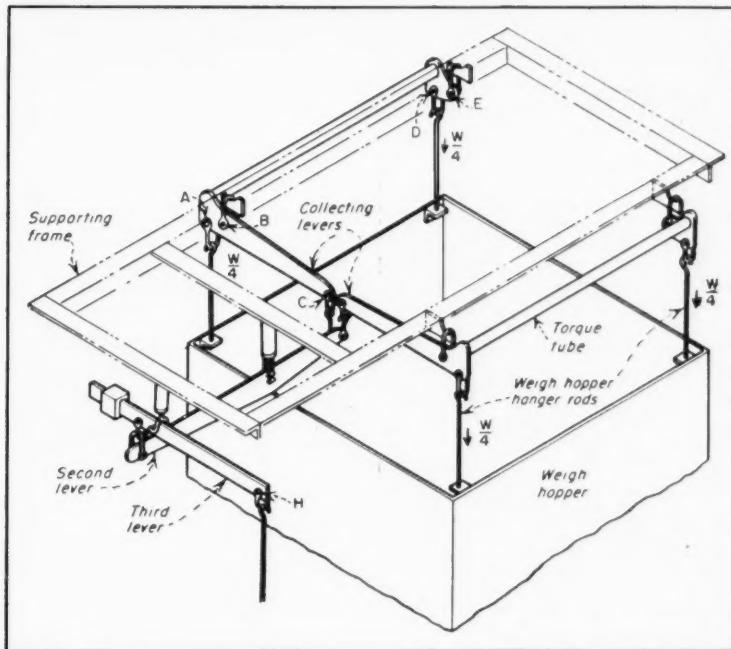


Fig. 1 . . . LEVER SYSTEMS typically have weigh hopper suspended by four hanger rods carried by pivots (knife edges). Reduction ratios come through second and third levers.

cal beam box (Fig. 2) with one weighbeam and a balance indicator. The pull rod is attached to the last lever in the scale system. The beam lifter or lock lever is a means to prevent the weighbeam from having any effect on, or applying any force to, the pull rod by the load transmitter. When the beam is "locked out" and the hopper is empty, the pull rod will transmit the force of $W/100$ described previously. This force tends to lift the right-hand end of the tare beam. Moving the counterbalance weight

can be moved back and forth along the tare beam until it will balance this pull. The indicator will show when the pull is properly balanced. This is all that the operator does when he "zero balances" his scale.

If the empty weight of the weigh hopper increases due to material sticking to the corners, or an accumulation of cement dust which has settled on the walls and hardened, the pull of the pull rod will be increased due to this build-up. Moving the counterbalance weight

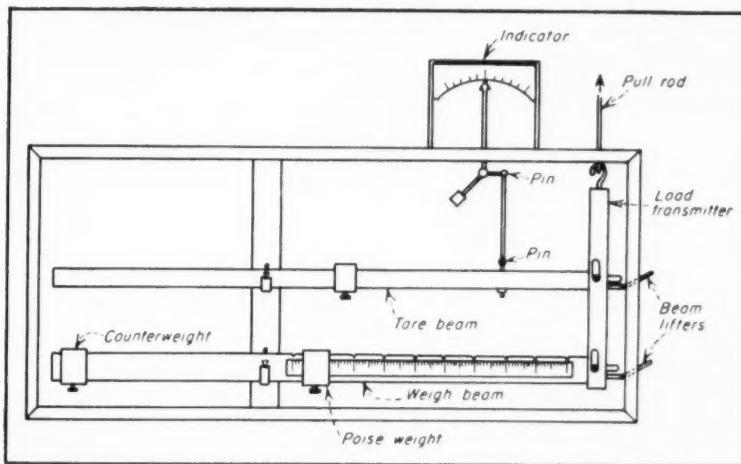


Fig 2 . . . TARE BEAM in a typical box with one weighbeam and a balance indicator. Pull rod is attached to last lever in the scale system. Scale can be "zero balanced" here.

HOW TO HANDLE WET JOBS

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NEW SEA LIFE HOME FOR MARINE STUDIOS

Marineland, Fla.

Contractor: Arthur Perry, Inc.



50 POINTS, 240-ft header: What volume could be handled by a well-point system of such size, working in very coarse water-bearing sand just a few ft from the ocean? Answer below.



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Why is that so? Simply because *higher-than-rated quality* in Red-Strand wire rope means *greater-than-expected safety and performance*.

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CONCRETE . . . Continued

to a new balance position will again zero balance the scale, compensate for this additional weight.

To avoid the serious consequences of weighing up less than the required amount of cement due to "build-up" in the cement hopper, it is wise to check the zero balance of the cement weigh hopper several times daily. If the hopper is found to be subject to "build-up" more frequent checks should be made.

The tare weight actually does not balance out the entire weight of the weigh hopper. It balances out the resultant or net effect of the dead weight of each lever, actions of pivots, shackles, linkages and pendulum, if used.

In Fig. 1 is shown a weight on the 3rd lever in the system. This is an additional tare weight because the size of the beam box does not allow the use of a weight sufficiently heavy. Some scales do not require this auxiliary weight. Some scales use a shot pot. Shot is added or taken out of the pot, as required, to balance out the scale, instead of moving it back and forth along the beam.

• The weighbeam generally is pivoted near one end to allow room for the poise weight and the graduated scale (Fig. 2.) Its counterweight, like the counterbalance weight on the tare beam, can slide along the beam. This weight is used to balance the entire weighbeam assembly about the pivot when the poise weight is at the zero graduation.

Continuing the example of the previous paragraphs, let us assume that the poise weight weighs 10 lb, that the distance from the pivot to the end knife edge which bears against the transmitter is 20 in., and that the weighbeam is graduated.

If the poise is set at zero and the beam is unlocked, it will swing into horizontal position. So long as the hopper is empty the scale lever system will be in balance and this balance condition will be shown by the indicator. If now the poise weight is moved to the 500-lb graduation, the weighbeam will be heavy on the one end; it will bear against the transmitter and the scale will not be balanced.

As material flows into the hopper, the pull of the pull rod will increase. When there is 500 lb of material in the hopper the increase in pull will be 5 lb. This exactly

(Continued on page 101)

MOVE MORE YARDS PER DOLLAR



WITH THIS BIG-YARDAGE LOADER!

THIS Cat*-powered Sierra Loader with D8 Tractor and single operator is working in a borrow pit on the Madera Irrigation Canal project for H. Earl Parker, Marysville, Calif. The hardpan's like rock—you have to rip all except the very surface, but this rugged rig is taking the rough going in stride. It keeps 25 trucks busy on a 3½-mile haul. Average load per truck—8 yards. Production per 8-hour day—2000 yards. Superintendent George L. White makes this comment: "We like our loader fine. It's really a dirt-moving machine."

With this big-capacity, one-man rig, you have a setup that cuts hours and dollars off earthmoving costs. The Sierra's 42" disc plow has a "slicing" action that assures fast cutting in tough material. Its 27-foot conveyor raises and lowers quickly at a touch of the control lever. Visibility is excellent, enabling the operator to maintain the right height for high- or low-side haulers for fast loading. All controls are handy to the operator's seat. And the rig has high maneuverability—a short turning radius makes it ideal for use in short or circular pits. Like all

Caterpillar-powered equipment, the Sierra Loader, with its Cat D318 Engine, is built to stay on the job day after day with a minimum of down time.

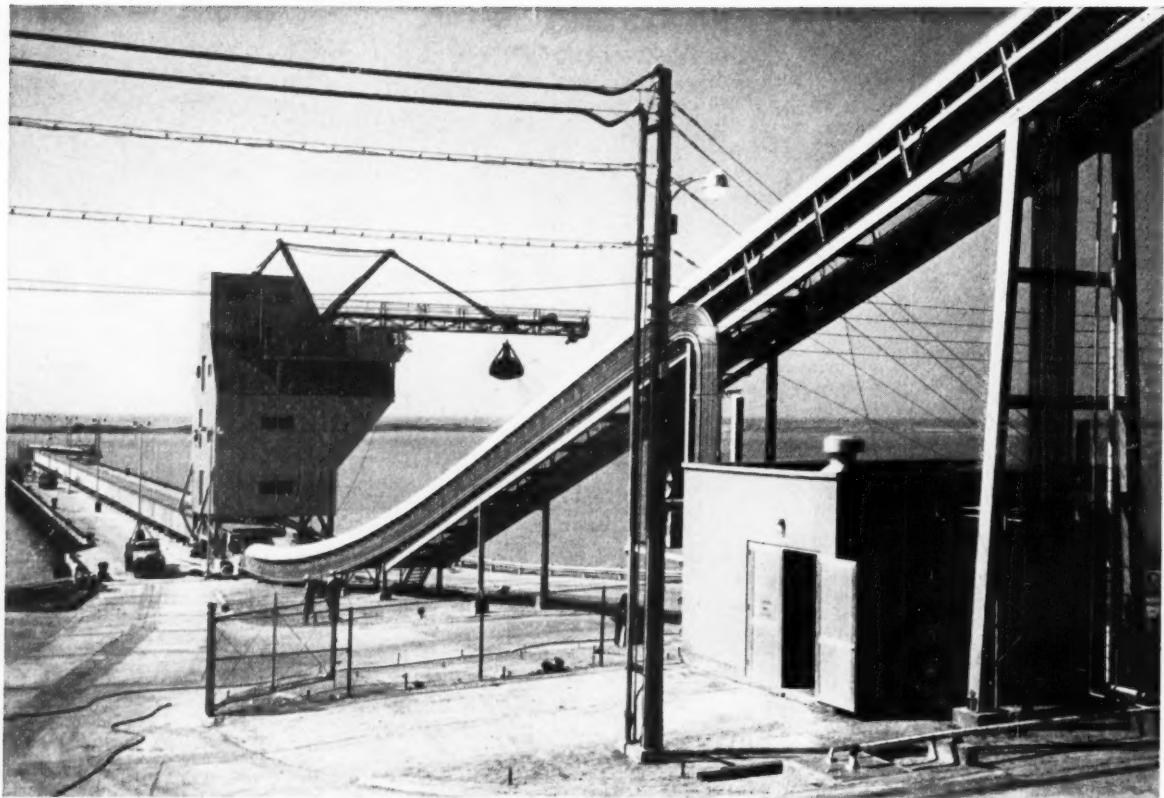
Your Caterpillar Dealer, a reliable source of service and information, will be glad to give you complete facts about this money-saving loader. Ask him to show you how it can help you move more earth for less. Call him today for a demonstration!

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NAME THE DATE...
YOUR DEALER
WILL DEMONSTRATE



'Finger-Tip' Controlled Clyde Unloader Handles Bauxite Ore At Reynolds' Plant

A 'twist-of-the-wrist' or the push of a button is all that is required to control operations of this modern Clyde Unloader. Raise or lower bucket, trolley in or out, open or close bucket, raise or lower boom, travel entire Unloader . . . all accomplished with remarkable ease and accuracy.

Clyde Unloader machinery and controls are specially engineered with simplicity as the keynote to permit consistently fast operating cycles. Clyde's exclusive double trolley arrangement results in a horizontal bucket travel which also contributes to higher speed operation and lower power consumption.

The Model 14 Unloader has a free digging capacity of approximately 300 tons per hour. Boom length is 70 feet. Boom can be raised for shipping clearance.

Here, as at other installations, Clyde's engineering 'know-how' has helped to lower bulk material handling costs. Write in for full information and for a solution to your own problem.



At the Reynolds Metals Co., La Quinta Plant near Corpus Christi, Texas, this traveling Clyde Unloader is quickly positioned to unload Bauxite ore from ships to conveyor.



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DULUTH MINNESOTA
ESTABLISHED 1899
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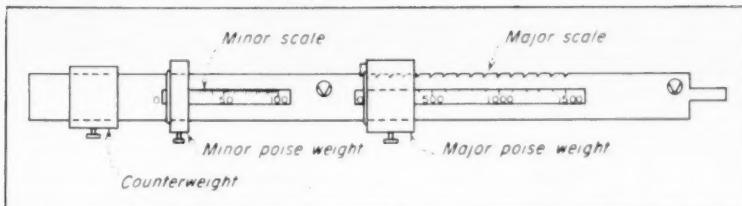


Fig. 3 . . . QUICK-SIGHTING WEIGHBEAM has major and minor scale, poise weight for each. To prevent errors, scale of fractional bar must have a capacity equal to increments of main bar.

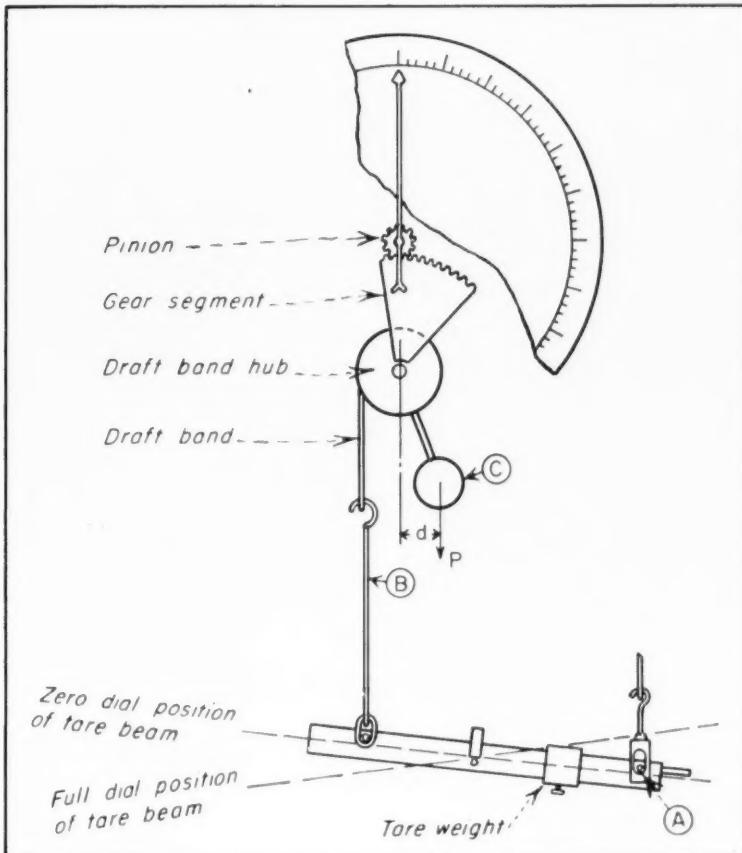


Fig. 4 . . . DIAL UNIT AND TARE BEAM shown schematically. Weight in batch hopper comes to tare beam at point A. Rod B and draft band rotate pinion to move weight-indicating pointer.

balances the force of the weighbeam on the transmitter, and the scale will be in balance. The indicator will show the balance condition and the flow of material should be cut off.

Weighbeams are of various designs. Some are made relatively long with the graduated scale extended over a considerable distance. This allows the use of a scale with ample space between weight graduations to permit the weight to be easily read. Every 5th or 10th graduation mark will be numbered. Other weighbeams may have graduations only for large in-

crements of weight. In this case an auxiliary or fractional weigh bar will be attached to the main bar.

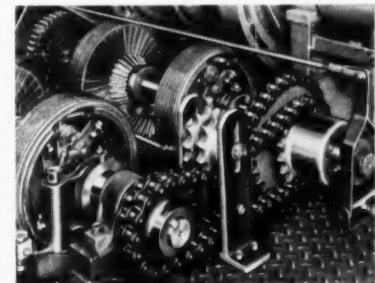
The fractional bar will have its own small poise weight and expanded scale properly graduated so the weights intermediate of the large increments on the main bar may be read. To prevent errors in reading, the scale of the fractional bar must have a capacity equal to the increments of weight on the main bar. The main bar also must have notches, one for each weight graduation, which, through engagement of a pawl on

(Continued on page 103)

HERE'S WHAT THE DESIGN OF NEWEST CRAWLER SHOVEL-CRANE ON MARKET MEANS TO THE USER

Schield Bantam Company's new, low-priced Crawler is getting wide customer acceptance of the rig's big-machine features.

- 2-SPEED, INDEPENDENT TRAVEL enables operator to move at varying speeds, forward or reverse, while operating attachment.



Model C-35 engineering includes identical swing and travel clutches; 2-speed travel.

- BIG MACHINE STABILITY is assured by long (123"), wide (94") track frame, nearly square, with a low center of gravity for big lifts up to 10,000 lbs.

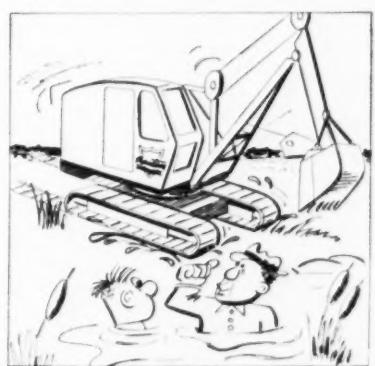
- HIGH SPEED OPERATION features immediate acting straight mechanical controls, easy positive braking action, 6 RPM swing speed, 143 FPM drag, and 175 FPM hoist line speed.

- LOTS OF FLOTATION is offered in BANTAM'S new C-35 Crawler which enables the rig to "stay on top" of soft, wet, spongy underfooting. Here's the C-35's ground bearing specs:

16" pads = 24" pads = 32" pads
5 psi 3½ psi 2½ psi

A specifications sheet is available.

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2211 Park St., Waverly, Ia., U.S.A.



(Advertisement)

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DIAMOND ROLLER CHAIN DRIVES



The main power drive on the Back Hoe made by the Schield Bantam Co., Waverly, Ia., is Diamond triple-strand Chain.

ON SCHIELD BANTAM TRUCK-MOUNTED BACK HOES

Specialists in excavating equipment design and manufacture aim at providing maximum yardage and long-life ruggedness.

To make sure, they select materials and components that can be counted on to help fulfill this aim. Invariably you will find the power transfer accomplished by means of long-life, reliable Diamond Roller Chains. Such a high efficiency drive is illustrated here—insuring full power transfer from the power plant for steady good yardage.

Throughout 63 years, Diamond Roller Chains have been constantly improved. Fully equipped and well staffed chemical and physical laboratories are maintained, with quality controls and multiple inspections to insure uniformity.

Practical recommendations are available that will save your time in arriving at correct roller chain applications. Catalog 649 mailed on request.

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IMPORTANT DIAMOND ADVANTAGES —PITCH HOLE PREPARATION

Maximum rigidity of links insured by special pitch hole preparation for 100% effective bearing area of pin and bushing. Longer life, smoother operation.

SHOT-PEENING SINCE 1944

Diamond Chain has long recognized that certain types of internal stressing of chain parts would increase fatigue resistance. To this end, link plates have been specially processed and chain rollers and other parts have been shot-peened since 1944.

CONCRETE . . . Cont'd from p. 101

the poise weight, will properly position the large poise at one of the main bar graduations.

Sometimes this fractional bar is attached to the main bar poise weight rather than to the main bar itself. The weighbeam shown in Fig. 3 (p. 101) has a major and a minor scale and a poise weight for each.

• **Balance indicators** show when the scale is in balance and also give the operator warning that correct weight is being approached when he batches materials. When the poise weight is set at the desired weight and the weighbeam is unlocked, the indicator pointer will swing as far off balance as the beam stops will allow. As material flows into the hopper, the indicator pointer will not move until almost all of the desired weight of the material is in the hopper.

When a certain point is reached, the pointer will start its swing toward the balance position. It will continue this swing so long as the material continues to flow into the hopper. This is an important function because without it the operator would have no warning that final weight was being approached and he would not be able to reduce the rate of flow. Many overweight batches would result.

The scale for balance indicators is often graduated on both the overweight and underweight sides of the balance point. For concrete plant scales there is no need to calibrate these graduations. If these graduations are calibrated and indicate pounds, the indicator is no longer a balance indicator but is what is known as an over-and-under indicator.

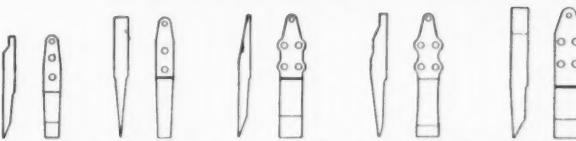
Most batcher scales have no means to adjust or change the number of pounds short of final weight which start the pointer swinging toward balance position. Generally, the prospective buyer need not concern himself with this for most batcher scales are built to conform with the great majority of codes and specifications so that the operator has ample warning.

However, if it is known that local codes require an over-and-under indicator, rather than a balance indicator, this information should be given to the batcher manufacturer so he can furnish a scale to conform to the requirement.

• **A dial unit and tare beam** are shown in Fig. 4 (p. 101). The pull from the scale lever system is



for Added Efficiency!



Types of Standard Teeth for Various Conventional Operations



Corner teeth

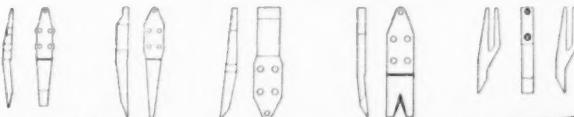


Side cutting teeth

A bucket of recognized ability becomes a greatly improved "digger" when equipped with teeth of proper type and design.

Owen Buckets are designed to utilize the weight of the bucket to force the teeth into the material when dropped contributing to their reputation as exceptionally efficient digging buckets.

Owen teeth are designed especially for "deep penetration"—teeth that "grasp and hold"—teeth for "breaking down resistance at corners" to aid shell penetration—side teeth "to cut wall clearance" in trench excavation, etc.



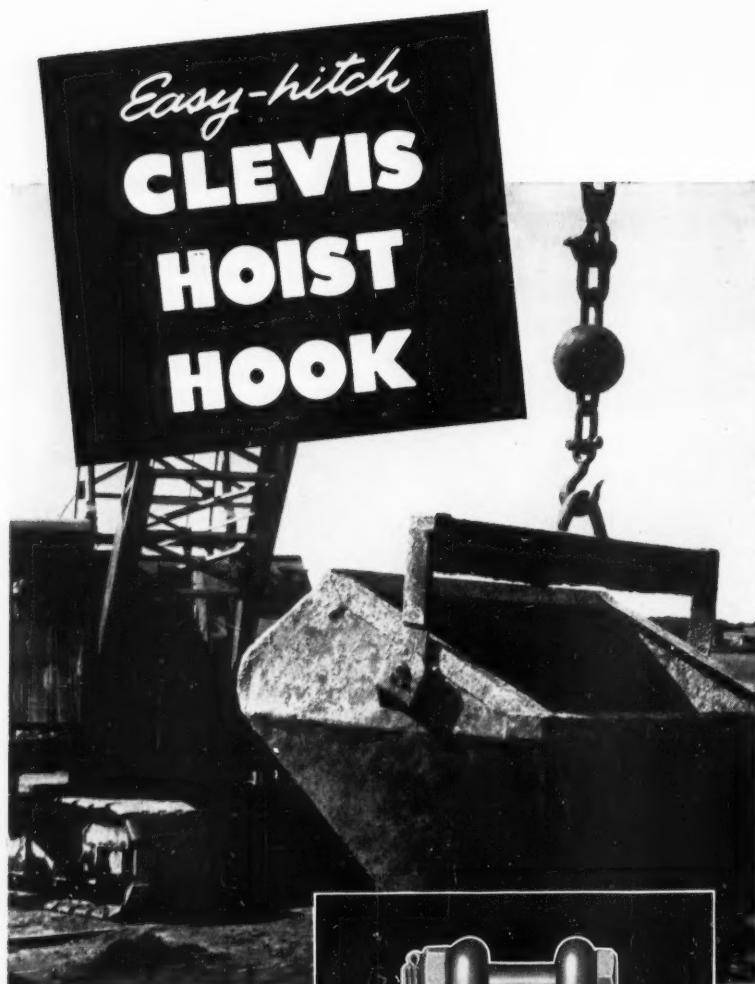
Special Teeth

Smashful every bite

BUCKETS AND GRAPPLIES
Write for Catalog

THE OWEN BUCKET CO.

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Here's the hook you've always wished for. A Clevis Hoist hook with a heat treated hex head bolt, check nut and cotter. It can be installed or removed in a jiffy. And it's made only by Laughlin.

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1214 Fore St., Portland, Maine

CONCRETE . . . Continued

transmitted to the tare beam at point **A**. This pull is transmitted to the dial unit through the pull rod **B**. It causes rotation of the pendulum weight **C** about its shaft. The greater the pull at **A**, the greater will be the rotation of the pendulum shaft required to produce a balanced condition.

In Fig. 4 the pull rod from the tare beam is connected to a draft band which is wrapped around a hub mounted on the shaft which supports the pendulum weight. Also mounted on this shaft is a gear segment which meshes with a pinion. The dial pointer is attached to the pinion shaft.

As the weight in the weigh hopper increases when material flows into it, the pull at **A** increases, increasing the pull at **B**. This pull on the draft band causes rotation about the pendulum shaft further displacing the pendulum, rotating the gear segment and causing rotation of the pinion and dial pointer.

It should be noted that the zero position of the tare beam is not horizontal and that it assumes any position between the zero and full dial position shown in Fig. 4. It is only at approximately half dial that the tare beam is horizontal. This is in distinct contrast to the weighbeam type scales which, when properly adjusted, have all numbers in a horizontal position when the scale is in balance. All levers in a dial type scale may be in any position between their zero dial and full dial positions when the weight of the material in the weigh hopper is read on the dial face.

Comparison of Weighbeam and Dial Scales

Whether to purchase a dial-type unit or one of the weighbeams with a beam balance indicator can be answered best by the plant owner or operator. As with many competitive systems, each has its merits. Practically all concrete batcher manufacturers will furnish either type.

WEIGHBEAM TYPE SCALES:

1. Are relatively simple mechanisms. There are few parts and their operation is appreciated and understood by practically all operators.

2. Are more rugged than dial units. This ruggedness is achieved without sacrifice of accuracy.

3. Are maintained more easily because of simpler construction and inherent ruggedness. Operators are more willing to keep the equipment clean than is the case with more delicate and complex mechanisms.

4. Cost less than dial type units.

5. For multiple material batchers, need have a capacity which does not exceed the greatest weight of any one material apt to be weighed in the batcher. Smaller weight divisions may be used on the weighbeam. For example, a 4-*yd* multiple batcher set up to handle 4 materials would require a 20,000-lb dial unit but only a 6,000-lb weighbeam (because there will be one weighbeam for each material, and no one material for a normal batch will exceed 6,000 lb. The graduations on the 6,000-lb weighbeam will represent smaller weights than would be the case if the weighbeam were required to have a capacity of 20,000 lb).

6. If out of adjustment, can more readily be adjusted so that they will truly indicate the weight than is the case with the dial units. No racks, pinions or gear segments are involved.

7. Require only that the operator bring the scale into balance after setting the poise weight in the proper position. With a dial unit it is necessary for him to cut off the flow at some unmarked weight graduation or, if markers are used, then the pointer reaches one of several markers. The average operator may, as a result, weigh with greater accuracy and with less fatigue when working with a weighbeam scale.

Certain of these advantages pertain to concrete batcher scales or other scales employed to weigh up a predetermined weight. The weighbeam scale is especially adapted for this type of operation. The desired weight is set up on the unit and the material added to a pan or hopper until the container holds this exact amount.

Dial units are especially adapted to determine the weight of a particular object, or quantity such as, for example, to determine the weight of material already in a truck.

Weighbeam-type scales may be equipped with a zero balance beam to indicate whether the scale is in balance when the weigh hopper is

(Continued on page 108)



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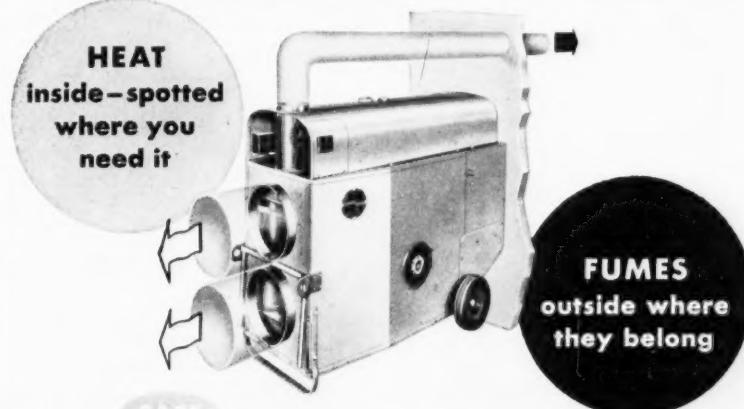
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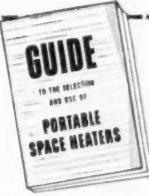
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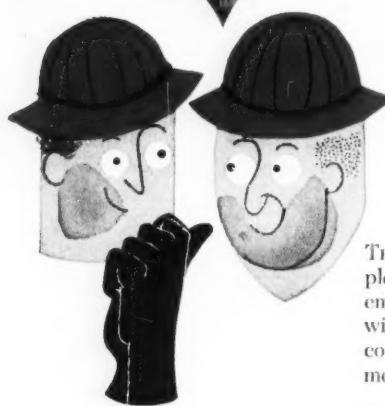
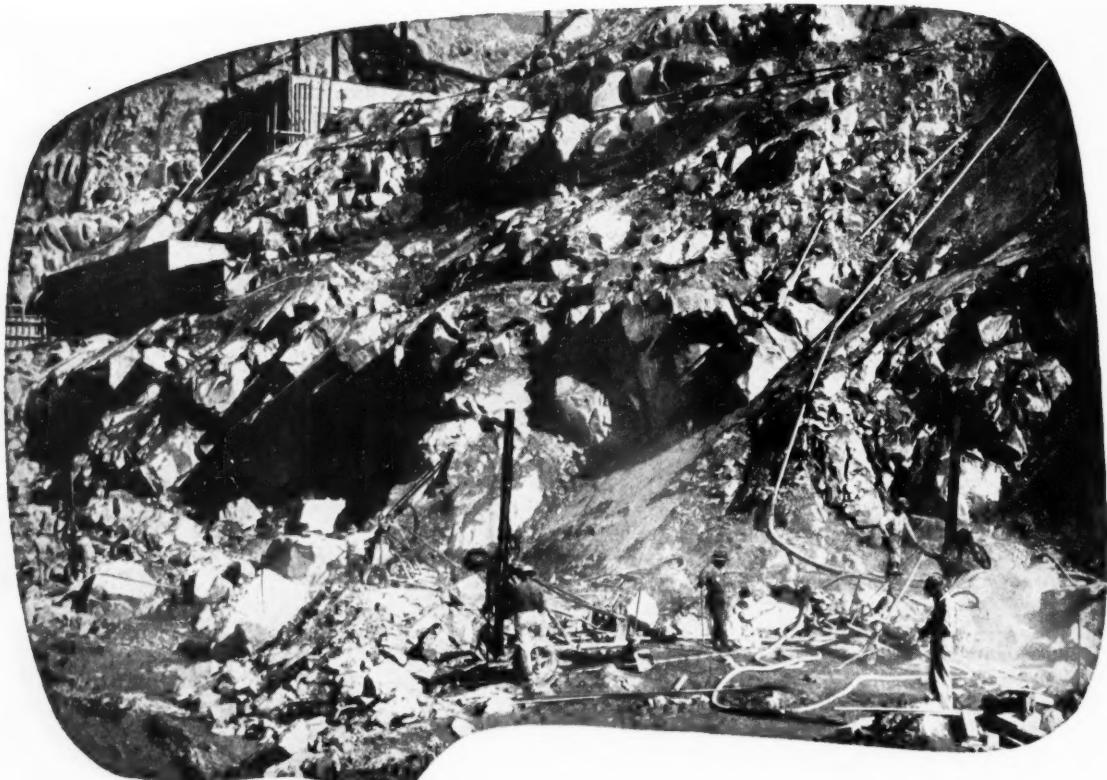
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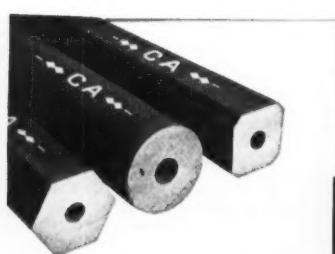


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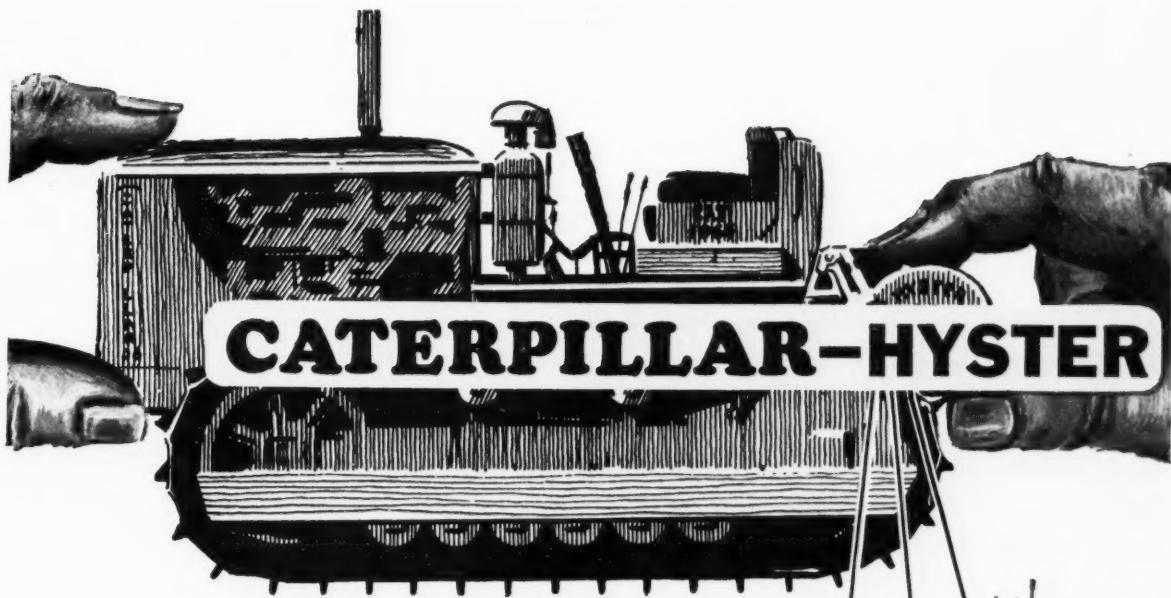
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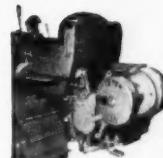
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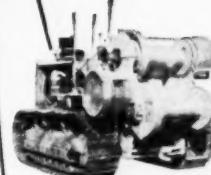
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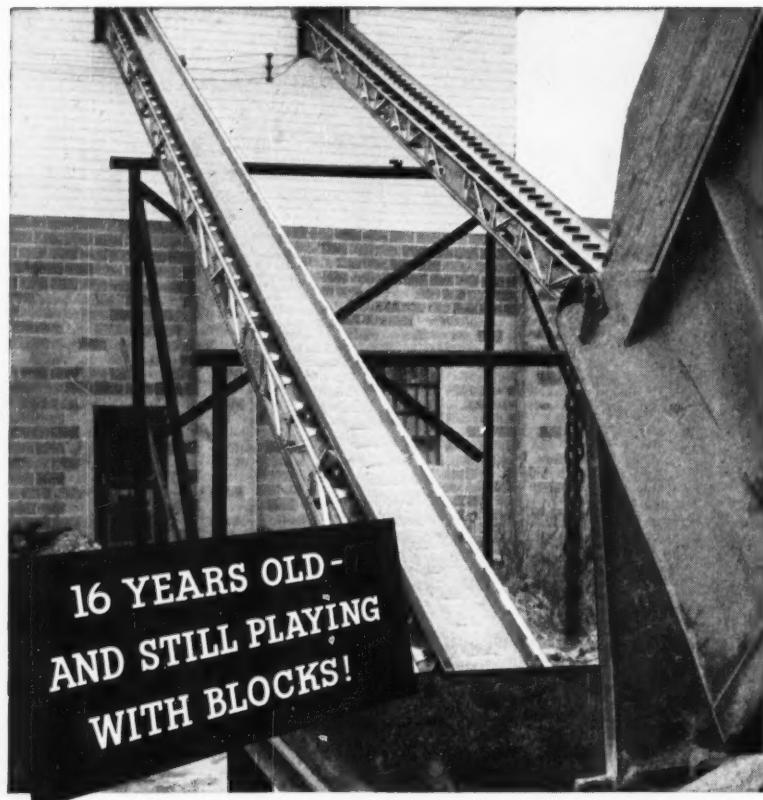


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CONCRETE . . . Cont'd from p. 105

empty. Such an arrangement also will inform the operator of any accumulations of material in the weigh hopper, or of failure of all of the material to flow from the weigh hopper when discharged. The tare beam of *Fig. 2* serves as a zero balance beam in addition to being a means of balancing the hopper weight. In this case the indicator is linked to this beam.

If the weighbeams are all locked out, the indicator, being attached to the tare beam, will show the condition of the weigh hopper after the material has been discharged. If the indicator is coupled directly to one of the weighbeams, it will be necessary to return the poises of this weighbeam to their zero position before the check for empty hopper can be made.

DIAL TYPE SCALES:

1. Readily allow frequent changes of mix. The operator does not find it necessary to reset all of the poise weights when changing from one mix to another. If he is operating without "markers" he needs only to weigh up the quantities as indicated by a table given to him for that particular mix. If the dial is equipped with markers he can shift these markers to their new position.

2. Will show, after discharge of the batch, the zero weight of the material in the weigh hopper. If there is an accumulation of material in a hopper, or the hopper does not completely discharge, this condition will be obvious to the operator because the dial pointer will not return to zero.

3. Show the amount of material in the weigh hopper at all times during the weighing operation. Certain specifications require this feature. At first glance it would seem that this is quite desirable, but closer scrutiny will reveal that this feature seldom, if ever, either speeds up or adds to the accuracy of the weighing operation. The operator is only interested in weighing up a predetermined amount of material. Properly designed weighbeam units with beam balance indicators give ample warning that the desired weight is being approached. He needs this warning to allow him to slow down the feed or to ready himself to cut off the

(Continued on page 112)

NEW INTERNATIONAL MEDIUM-DUTY FOUR-WHEEL DRIVE TRUCKS

For Off-Highway or Highway Operation

Now, INTERNATIONAL Truck advanced engineering makes possible another development in transportation efficiency—*two new medium-duty four-wheel drive models* that open new possibilities for truck operators in scores of fields.

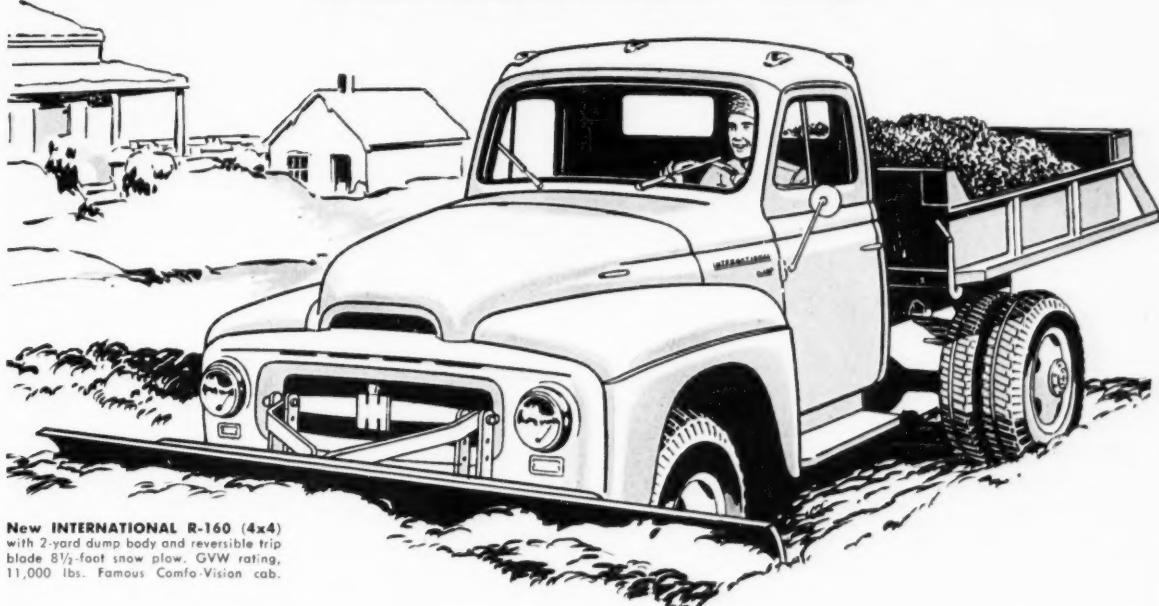
You can haul men, tools, equipment to any job—through mud, sand, and snow—over terrain where conventional trucks can't go. With front axle disengaged, you can operate normally on the highway.

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models are built for the toughest kind of work. Like every INTERNATIONAL, they give the low operating and maintenance cost and long life that have made INTERNATIONAL the heavy-duty sales leader for 21 straight years.

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Specifications
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Two chassis models. Model R 140 (4x4)—130 inch wheelbase, 60 inch CA; 142 inch wheelbase, 72 inch CA, GVW rating 11,000 lbs. Model R 160 (4x4)—154 inch wheelbase, 84 inch CA; 172 inch wheelbase, 102 inch CA, GVW rating 15,000 lbs.

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Eight forward speeds, two reverse. Transmission has four forward speeds, one reverse, with 2 speed transfer case.

Easily converted for highway use. Special transfer case permits disengaging front axle for normal 2 wheel drive operation.

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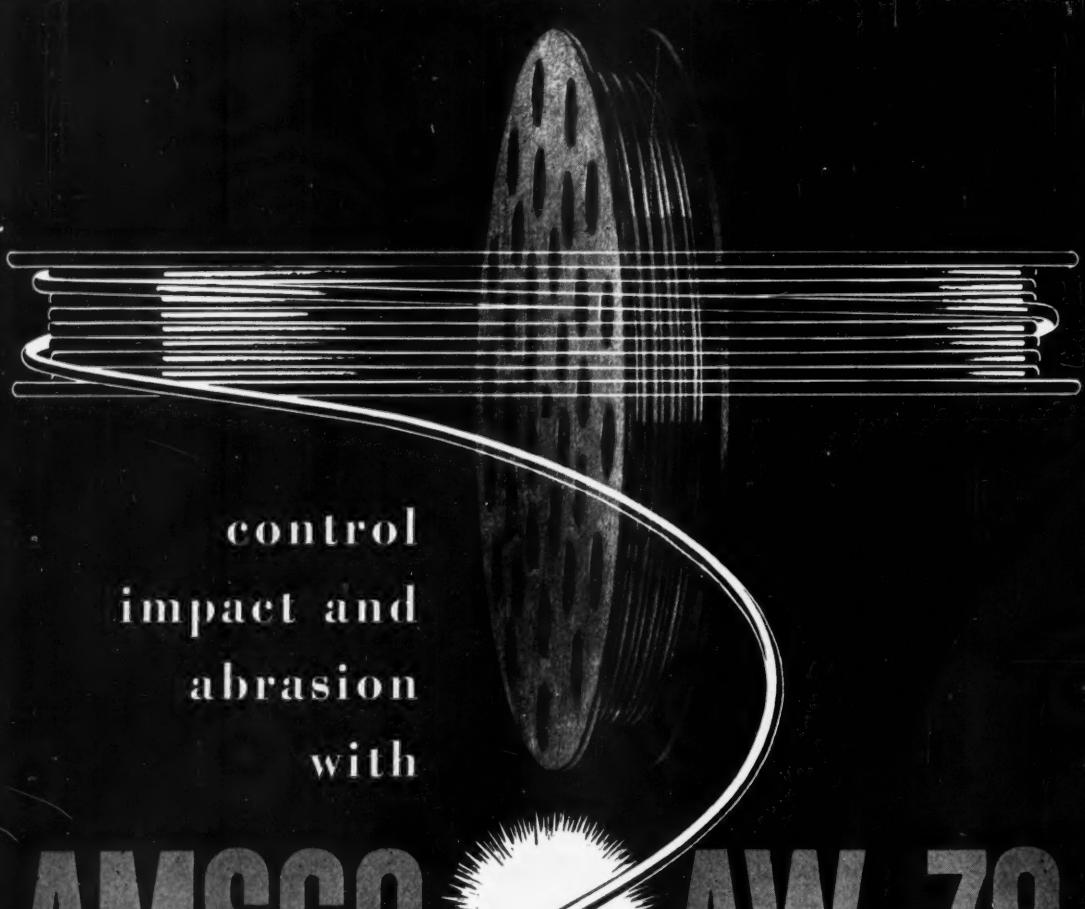


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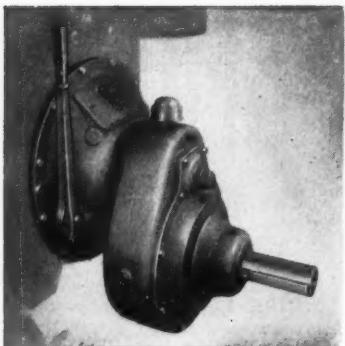
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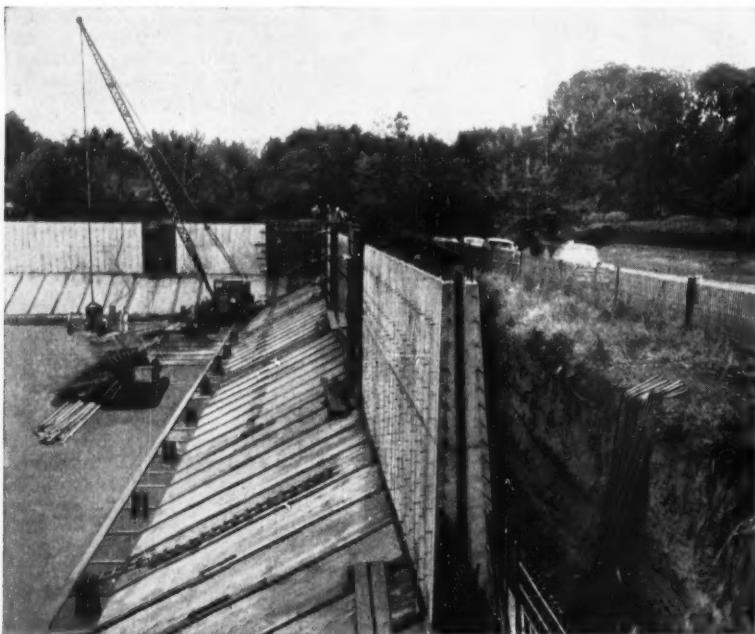


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CONCRETE . . . Cont'd from page 108
the flow of material into the weigh hopper. The beam balance indicator gives him all he needs in this respect, and furthermore, allows him to relax momentarily until the balance pointer starts to move.

4. Generally can be more readily equipped and at less expense for graphic recording than can weigh-beam units.

5. Comprise practically all the scales equipped for printing the weight of material on a tape. A weighbeam type scale would have to be equipped with a dial unit also if a printed record were required.

It must be pointed out that certain units are manufactured which operate on a principle different from the majority of concrete batcher arrangements. Certain of the advantages cited for weighbeam and dial units do not apply to them. For example, a certain unit is manufactured which is a combination of weighbeam and dial unit.

The operator sets the desired weight on one of several weighbeams. The dial pointer swings around the dial until it indicates the same weight as set up on the weighbeam. When the operator opens the fill gate, allowing material to flow into the weigh hopper, the dial pointer swings back toward the zero of the dial. When the pointer reaches zero the correct weight of that material will be in the weigh hopper. This principle of "back-weighing" has certain advantages along with disadvantages.

Dampening Means

Many specifications require that scales be equipped with a means to dampen oscillations of the indicator of a weighbeam unit or the pointer of a dial unit whenever it takes too long for these pointers to come to rest. Not only is it necessary to meet these specifications but it is also highly desirable to provide these means in the interest of speeding up operations. Not all scales require such a device. The specifications are written to eliminate them when the scale will come quickly to rest without them.

A dash pot is the most common device for dampening. It consists of a loose-fitting piston moving up and down inside a cylinder. The piston is linked to the scale lever system and moves whenever the

levers move. The cylinder is filled with a fluid which provides the dampening effect, flowing around the edges of the piston as it moves up and down.

Fluids in the dash pots do not interfere with the accuracy of the scale. They resist the motion of the scale members by their action on the piston. This resistance is great for rapid motions of the piston and approaches zero when the piston comes to rest.

Most dash pots are filled with kerosene or light oils. Diesel engine fuel is an excellent dash pot liquid. The dampening effect can be increased or decreased by using a heavier or thinner oil, as desired. A mixture of kerosene and diesel fuel oil will work quite satisfactorily if diesel oil alone produces too great a dampening effect. Water should never be used as a dash pot fluid because it will freeze in cold weather, sometimes cracking the dash pot.

Paddle and Drag

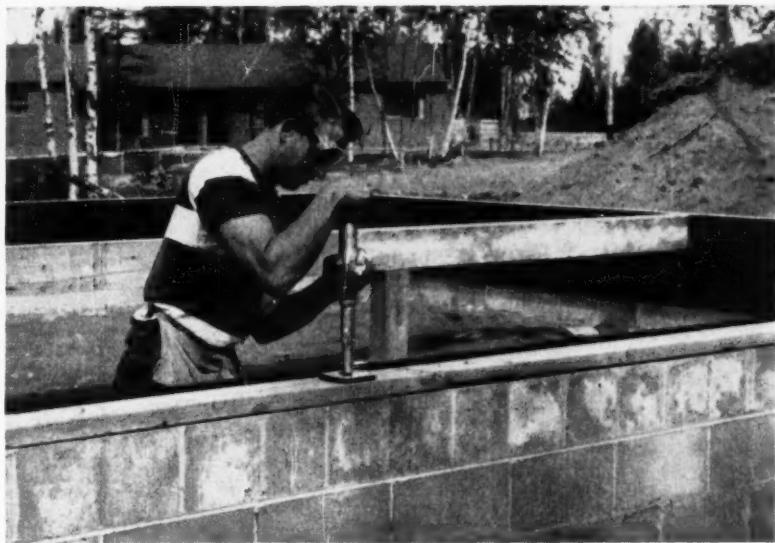
Among other types of dampening devices used effectively is a paddle attached to the beam balance indicator, and which moves back and forth in a chamber filled with kerosene. Another arrangement uses a drag element which rotates back and forth in a sealed cylinder partly filled with one of the silicone fluids. This drag element is mounted on the same shaft as the indicator pointer of the scale. The viscous silicone fluid produces the desired dampening effect. It has the advantage that the viscosity of the fluid is little affected by temperature changes. This same is not true of petroleum oils.

Dampening devices have a definite purpose. They should be used. It is not unusual to find the dash pot disconnected from scales in plants which have been operating for some time. This is generally an indication of unwillingness on the part of the operator to give them the little attention that they require, rather than that they serve no useful purpose.

The fourth article of this series will appear in the January issue.

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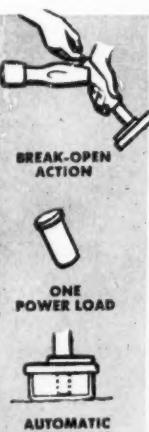
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DRIVE-IT 320 WITH BREAK-OPEN ACTION

This Alaskan builder uses the new DRIVE-IT 320 with Break-Open Action to fasten 2x6 base plates to concrete block. The powder-operated tool "is more economical by at least 30% ; results in material and money savings".

Almost all concrete or steel anchorages can be made with more savings and greater strength with DRIVE-IT.



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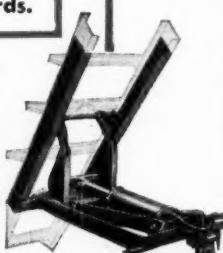
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IN ALL SIZES — FOR ANY USE

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DRIVE

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in bid competition

—with the safer, action packed

VELOCITY-POWER
DRIVER

Because getting the job done faster, for less, is a big factor in meeting today's increasing competition, the speed and safety advantages of the Velocity-Power Driver are vital in your contracting picture.

This modern production-maintenance tool lets you finish off those fastening and anchoring jobs simply, easily, instantly. Just load—position—fire! Job's done. Interchangeable barrels let you drive either $\frac{1}{4}$ or $\frac{3}{8}$ -inch studs from the same firing unit. You have a wide selection of studs—solid head, internal or external threaded types. And because the cartridge and stud are integral, there's no time wasted matching and fitting—they're ready for use.

Look at these safety features. A spring-loaded safety arm that must be rotated and held before firing prevents accidental discharge. Permanently attached spall-shield adds to the safety factor of the unit. All cartridges are center-fire types, completely assembled, and color-tipped to assure the right load for the job. Unique barrel design avoids ricochet, flash, recoil.

Write today for the details on this important tool . . . see how it can help you keep your bid down, and still maintain your profit level on every job.



ALSO AVAILABLE

The Velocity-Power Driver, with separate spall-shield, features all the advantages of the above unit. This serviceable Driver is especially useful when a great deal of work in deeply recessed areas is required.

VELOCITY POWER TOOL COMPANY

201 North Braddock Avenue, Pittsburgh 8, Pa.



HERE'S WHAT the new Austin-Western hydraulic crane looks like in both the four-wheel tractor-mounted design and the more conventional truck mounting. Both types are available with outriggers for maximum stability for heavy lifts. The crane is unique because

of hydraulic vane type motors for both hoist line operation and for swing, and hydraulic ram operation for boom crowd and lift. All hydraulic operations are double-acting, permitting precise control at all times. No clutches, no band brakes.

Austin-Western's All-Hydraulic Crane

Take your choice of mountings—four-wheel, self-propelled tractor or conventional truck—and you'll still have a hoisting rig the likes of which has never been seen before.

Another Equipment Development Report

By HAROLD W. RICHARDSON, Editor

OUT OF EXPERIENCE in producing some 9,000 military units by the Austin-Western Co., Aurora, Ill., has come a new civilian model all-hydraulic crane, different in operating principles from anything now on the market. It is a heavy-duty, full-revolving machine with combination telescopic and live boom, rated at 5 tons maximum capacity.

One model is mounted on a four-wheel, self-propelled carriage with optional torque-converter drive, four-wheel drive and all-wheel steering. Another model can be mounted on any conventional 2½-

(Continued on page 120)



Wire Rope at Work — This is the woodyard at Kraft Center, Cantonment, Fla., one of the largest enterprises of the St. Regis Paper Company. Here they build and move mountains — enormous mountains of logs. The stockpiles normally carry an inventory of 30,000 cords, and 1200 to 1400 cords are fed daily to the chippers at the paper mill.

The cranes you see in the yard are moving vast quantities of pulpwood, building up reserves so that the mill, with its healthy appetite for logs, will never go hungry. This is a job, too, for Bethlehem Wire Rope, which is rigged on the hard-working cranes. It is a punishing chore by any standard, the kind entrusted to Bethlehem rope in virtually every type of industry, wherever there's lifting or hauling to be done.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
MINING • CONSTRUCTION • PETROLEUM • EXCAVATING • QUARRYING • LOGGING • MANUFACTURING



"MAGIC-CARPET" MAKER

SPREADS

Material Evenly

COMPACTS

to Uniform Density

LEVELS

Automatically
Without Forms



Barber  Greene

THE BARBER-GREENE TAMPING-LEVELING FINISHER

When the job calls for the highest quality bituminous surface, you'll do it best with the B-G Tamping-Leveling Finisher.

With this superbly designed machine, you are able to lay every type of mix—hot or cold—from clay stabilized gravel to high-type sheet asphalt. Whatever type mat you are laying, the B-G Finisher automatically measures the correct amount of compacted material—then simultaneously tamps, levels and strikes off to produce a ripple-free surface that is maintained under rolling and

traffic. Because the material is compacted while it is being laid, you are assured of a surface of uniform density. And with the B-G leveling principle you compensate even for abrupt changes in the subgrade.

It will pay you to investigate this unequalled, universally preferred method of paving streets, highways, runways, parking lots, tennis courts and similar jobs. You will learn, for example, how the B-G Finisher saves truck time, minimizes rolling and reduces the size of crew. Investigate today!

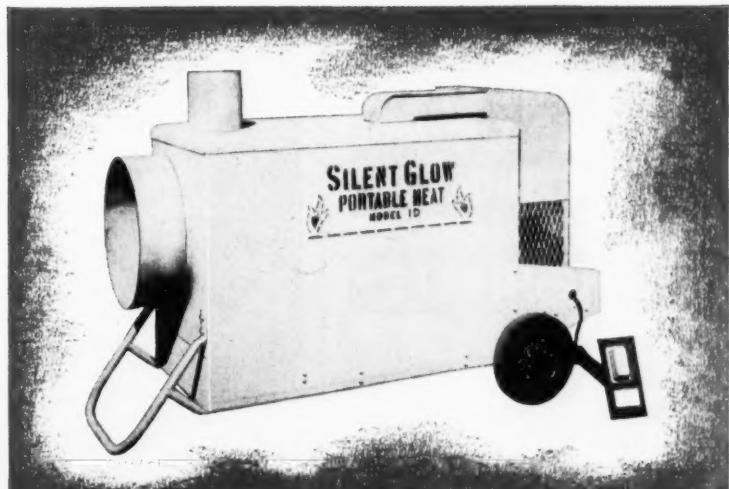
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Aurora, Illinois, U. S. A.

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offers a complete line of
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Radiant and Forced Air
168,000 B.T.U. per hr.



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189,000 B.T.U. per hr.



Model AAS
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Model OH
Suspended Heater
Saves floor space.

Whether your portable heating preference is for direct fired (open cycle), indirect "fresh air" heating or radiant heat, your Silent Glow Distributor has it — in this most complete line of portable heaters available anywhere.

But your Silent Glow Distributor does a lot more than that for you. He is as close as your phone, ready to study your particular problems on the job, ready to give you prompt service. He stocks parts for you — stands ready at all times to help out in an emergency. He works cooperatively with his neighboring distributors (most of whom are AED members) to serve you faster and better than ever before. Silent Glow backs its distributors with a complete line and with such outstanding equipment as the powerful new ID indirect fired heater shown at the top of this page — twice the heat for 25% more fuel — 420,000 B.T.U. fresh air heat.

Find out about it!

Investigate

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THE SILENT GLOW OIL BURNER CORP.
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Please send me information on Silent Glow Portable Heaters.

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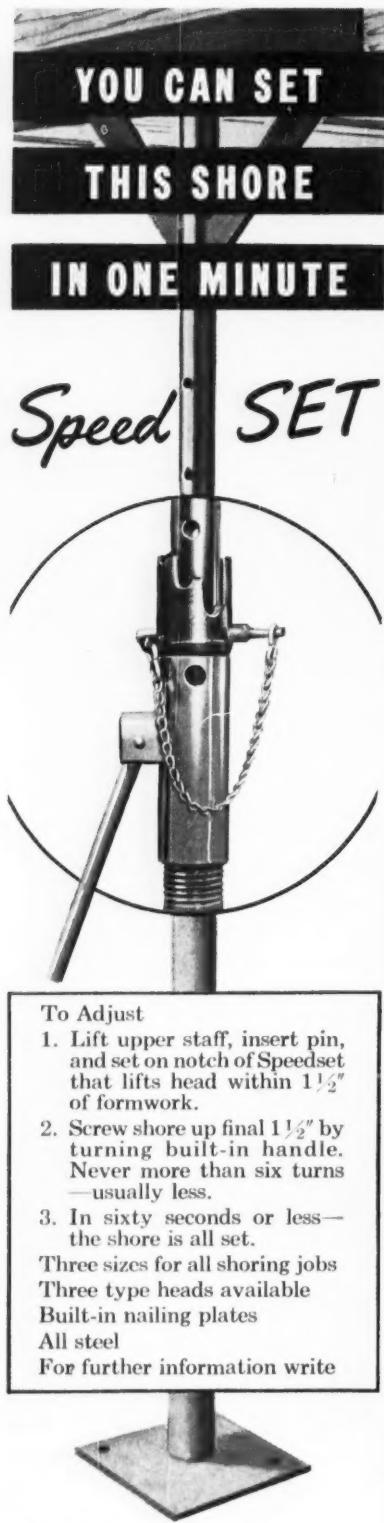
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CITY _____ STATE _____

Those Who Know Choose
SILENT GLOW
OIL BURNERS

ALL-HYDRAULIC CRANE . . . Continued from page 116

What the Versatile Hydraulic Crane Can Do



To Adjust

1. Lift upper staff, insert pin, and set on notch of Speedset that lifts head within $1\frac{1}{2}$ " of formwork.
2. Screw shore up final $1\frac{1}{2}$ " by turning built-in handle. Never more than six turns—usually less.
3. In sixty seconds or less—the shore is all set.

Three sizes for all shoring jobs
Three type heads available
Built-in nailing plates
All steel

For further information write

WACO Manufacturing Company

3560 Wooddale Ave.
Minneapolis 16, Minnesota

Canada
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Windsor, Ontario

West Coast
Waco-May Co.
Los Angeles, Calif.



Its horizontal boom can reach into a truck van, pick up a load and . . .



. . . walk right into the shop with it.

ton truck with power take-off.

Hydraulic motors for line hoist and swing set the Austin-Western unit apart from any all-hydraulic crane developed up to now. Telescopic boom crowd and boom lift are by hydraulic rams. All four basic operations are powered by a single hydraulic pump, controlled directly by four lever-actuated hydraulic valves without clutches or

friction bands. The hydraulic system works in the 1,000-1,200 psi range.

Crane assemblies are similar for both tractor and truck mountings, except for location of controls. On truck models, the hydraulic control valve bank and operator's seat are fastened to the side of the revolving boom gantry. On tractors, the operator sits at the front end



IT CAN DO that difficult stacking job for you with ease, because of precise control of all operations. Good for palletized loads, too!



LONG REACH, up to 24-ft rad., is possible when boom is extended by repinning boom sections. Fine for steel erection. It could walk right through a low building job.

of the carriage, with crane and tractor controls banked in front and at one side.

The boom can be raised by ram action from horizontal to 45-deg elevation. Special sideplates are available that will raise the gantry by 11 in., and this additional clearance will permit 60-deg boom elevation, if desired. The telescopic boom is made up of two box sec-

tions, one sliding within the other.

The inner section is actuated by a 96-in. double-acting ram, which permits boom extension from 10-ft min radius to any length up to 18-ft rad. This inner length likewise is made up of two telescopic sections pinned together into a single unit. By simple adjustment of the pins into other holes, the inner boom can be stretched 6 ft, but if

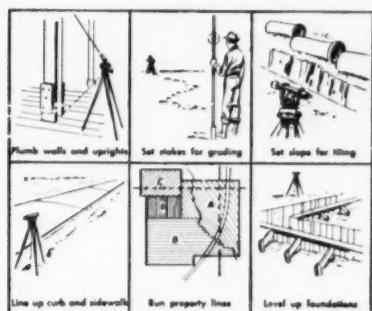
White Universal Level-Transit...



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YES, the White "Universal" Level-Transit is the most practical, complete instrument on the market. Now available in a new improved model — the No. 3000 — with internal focusing, coated optics, guarded vertical arc. In fact, every feature to assure you lifetime durability and accuracy. And the price is *only* \$195*, complete with tripod. See your dealer, or write DAVID WHITE COMPANY, 343 W. Court Street, Milwaukee 12, Wisconsin.

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of instruments.

*Price subject to change without notice.

7195



AUSTIN-WESTERN ENGINEERS think the truck-mounted rig, like this one, will become the favorite for construction operations. We're not so sure, for the tractor-mounted crane, because of its extreme maneuverability, is a natural for a world of construction tricks. How-

ever, A-W is planning on a package mounting for the truck crane, with independent engine replacing the conventional power take-off for driving the main hydraulic pump. Both models will be available with either manual or power-operated outriggers for added stability.

this is done, the boom range (horizontal position) then becomes 16 ft to 24 ft rad.

Boom position is automatically locked at any point whenever the valve control is returned to neutral.

Both extension and retraction of the boom are under power control at all times. Boom crowd speed is 32 fpm forward, 50 fpm reverse.

The load hoist line drum is powered by a Vickers vane-type hy-

draulic motor operating through a worm gear that holds the load at any point. The hydraulic motor gives precise control of the load in both hoisting and lowering with-

(Continued on page 124)

**More footage per day...
More footage per blade...
LOWER COST PER CUT!**

**Felker DI-MET
MODEL 252**
The heavy duty
CONCRETE CUTTER
that pushes more!

**CUTS MORE CONCRETE PER DAY BECAUSE
THE MODEL 252 IS SELF-PROPELLED! OVERCOMES
OPERATOR FATIGUE, ELIMINATES FREQUENT REST
PERIODS, COVERS FAR MORE FOOTAGE IN A DAY!**

★ **LONGER BLADE LIFE**—No sudden bumps and jolts to add unnecessary wear and tear on the diamond wheel. Smooth, uniform POWER FEED adds longer blade life—CUTS COSTS! Actual field reports have shown blade life as much as doubled.

★ **DEEP CUTS**—approximately 7" maximum with 18" blade. 13.5 h.p. engine furnishes power to spare.

★ **DOUBLE END SPINDLE** for right or left hand cutting.

★ **HINGED BLADE GUARDS**—Front half lifts, exposing blade for close-up work.

Ask your Felker DI-MET Representative for recommendations.

**POWER — SPEED — MANEUVERABILITY
PLUS LOW COST!**

Felker DI-MET Model 135 Here's the concrete cutter for your every-day jobs... trenching, patching, cutting curbs, ramps and dozens of other uses! Light, easily maneuverable with powerful 13.5 h.p. engine. Built for 12" blades but powerful enough for 18" blades (with special guard). 3 wheel design. Other concrete cutters available. Ask for details!

**Use DI-MET Machines and Blades for
every concrete cutting requirement!**

Here's an unusual application—sawing up and re-locating a concrete wall! Savings: \$241.00 on a \$991.00 job!

Felker DI-MET the SEGMENTED type diamond blade with peak performance! Built by the only manufacturer making both concrete cutters and diamond wheels. Bond variations for every cutting requirement insure more footage—lower cost per cut!

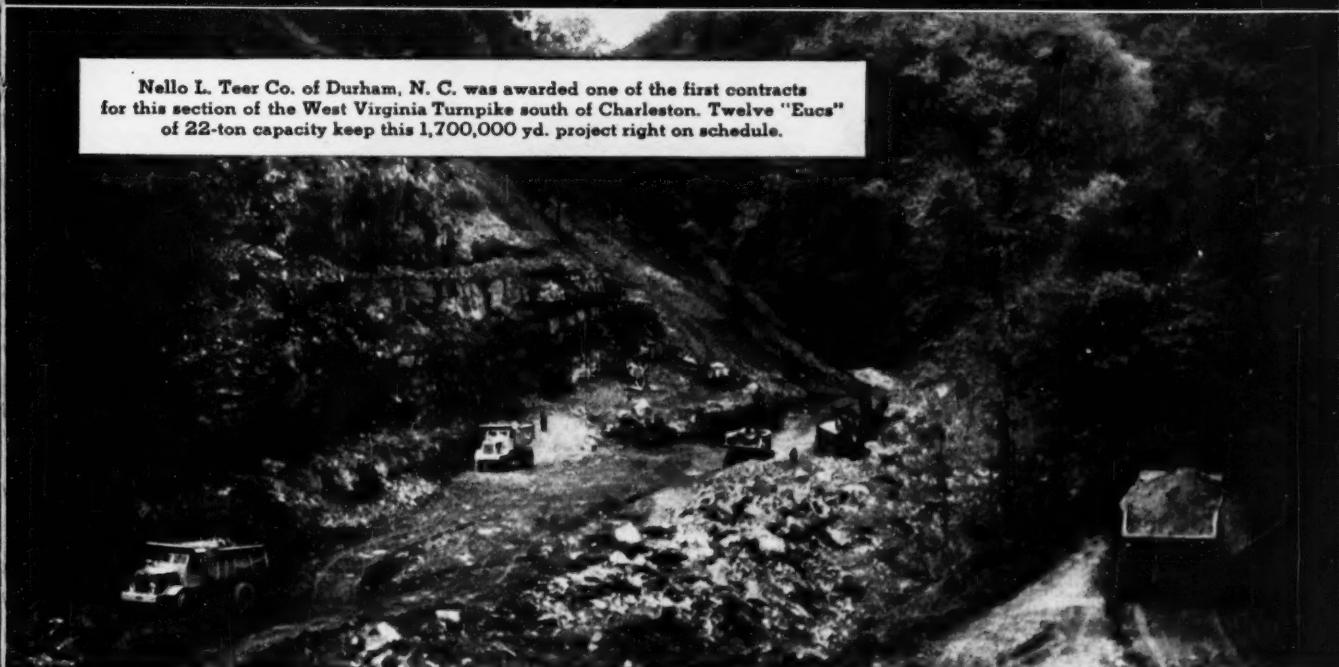
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DI-MET**

FELKER MANUFACTURING CO.
TORRANCE • CALIFORNIA

World's Largest Manufacturer of Diamond Abrasive Cut-off Wheels and Equipment

191 "Eucs" carving out a Turnpike in West Virginia

Nello L. Teer Co. of Durham, N. C. was awarded one of the first contracts for this section of the West Virginia Turnpike south of Charleston. Twelve "Eucs" of 22-ton capacity keep this 1,700,000 yd. project right on schedule.



BUILDING the 88-mile two-lane West Virginia Turnpike is a big, mighty tough job... over 25 million cubic yards of excavation, mostly rock. Some of the contract sections will run up to 600,000 cu. yds. of excavation per mile due to the rugged terrain which requires deep cuts and fills as high as 120 feet.

The contractors on this rush job—scheduled for completion June 1, 1954—have been almost unanimous in their selection of Euclid equipment for this heavy grading. They know from experience that they

can depend on "Eucs" to move more loads per hour at lowest cost... they know that "Eucs" have plenty of power to move big loads up steep grades and over the most difficult haul roads... and they know, too, that "Eucs" are tops for job availability when it comes to handling tough yardage.

Every day 191 "Eucs" are proving that the choice of these contractors was the right one. Your Euclid Distributor will be glad to show you why "Eucs" are your best bet for more production and more profit.



On this section "Eucs" are loaded with heavy rock and shale by shovels of 2½ yd. capacity.

It takes plenty of power to haul 22-ton loads on grades that exceed 20% on many of these jobs!



The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

CABLE ADDRESS: YUKLID

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Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



4-Cycle Air-Cooled



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Power for garden tractors, mowers, pumps, sprayers, snow removal equipment, elevators and hoists, mobile saws, concrete mixers, compressors, feed grinders, industrial and lift trucks, and a wide range of tools and equipment for industry, construction, farm and home.

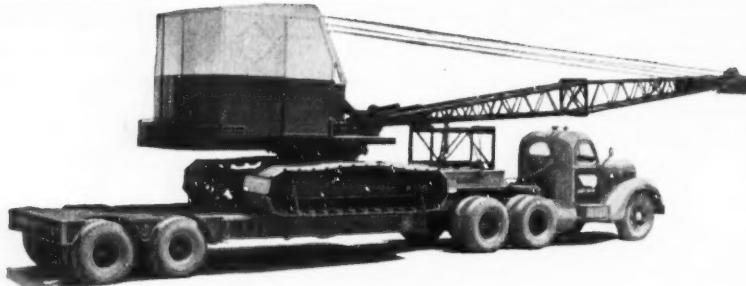
Engineered and built to the quality standards that have won acceptance for Kohler Electric Plants the world over.

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MODEL M80-D
Multiple axle drop bed semi, capacities 35 through 75 tons.



MODEL K80-D
Dual axle drop bed semi, capacities 15 through 30 tons.



MODEL PX
Heavy-duty tandem axle, spring mounted platform or flat.

YOU CAN DEPEND ON

TRANSPORT TRAILERS CARGO CARRIER MODEL GPX-F

Especially designed for safe, secure hauling of heavy cantilever loads. Capacities 16 through 35 tons. Exclusive TRANSPORT tandem axle assembly gives full oscillation of each axle over rough roads . . . adds extra mileage to trailer tires . . . reduces road shock transfer to payload. TRANSPORT semi-trailers fit single or tandem axle truck tractors. Flat deck as shown or drop deck.

FOR ADDED SERVICE . . .

Single or dual axle TRANSPORT front dollies convert semis to full trailers easily and quickly.

WRITE FOR COMPLETE INFORMATION



ALL-HYDRAULIC CRANE . . .

Continued from page 122

out clutches or brakes. Line pull is rated at 6,700 lb; single-line speed is 40 ft per min. The hoist drum will take 95 ft of $\frac{1}{2}$ -in. wire rope, and the hook block can be reeved up for single or double line.

To effect boom crowd and hoist line operation along with unlimited 360-deg rotation, hydraulic pressure for the boom ram and hoist motor is transferred through a swivel valve at top of boom mast. Of course, boom and hoist operations are independent. But to hold the hook in relative position to the boom tip when operating the crowd, it is necessary to work the boom and hoist control valves together. The hoist line must be paid out or pulled in as the boom is extended or retracted.

A double-acting vertical hydraulic ram mounted within the boom gantry assembly lifts the boom from horizontal position to 45-deg (or 60-deg) elevation. Angle of boom is maintained automatically so long as this control valve is in neutral.

An innovation from any other hydraulic unit is unlimited 360-deg boom revolution by means of a vane-type hydraulic swing motor operating through worm and spur turntable gears. Normal revolution speed is 3.3 rpm in either direction, but metering hydraulic valves permit slowing swing speed down to a snail's pace. Stop lugs are available to cut down swing angle from normal 360 deg to any angle desired.

Positive Hydraulic Controls

Thus, it is readily apparent that all four major operations—boom crowd, load lift, boom lift and boom swing—are hydraulic operated and controlled. All four operations are double-powered, both up and down, in and out, right or left, as the case may be, to give positive control at all times. And, in all cases, all movement and action are stopped when the control valves are returned to vertical position—and the controls are spring-loaded so they automatically return to neutral when released. This makes the new rig just about the simplest thing to operate in the crane field today. Military officials have often stated that any GI can become a proficient operator of the military version in 10 min, and the civilian model is identical as to controls.

(Continued on page 127)



Put a Dragon's teeth to work on your

RESERVOIR • SETTLING BASIN • SWAMPLAND FLOOD CONTROL

● Desilt . . . fill . . . reclaim land with portable Ellicott Dragon hydraulic pipe line dredge. Newest of Ellicott dredge models—the Dragon performs one hundred and one dredging operations quickly, efficiently and at a minimum of cost. Dragon 8", 10" and 12" models remove or deposit mud, silt, sand, etc., at rates up to 250 cubic yards per hour . . . to distances over 3000 feet.

The Dragon is portable—easily knocked down and transported by trailer-truck or flat car—and quickly re-assembled on land or water. The Dragon is versatile—a compact unit with every modern dredge feature, designed to operate in locations formerly inaccessible to dredges. It permits contractors, industries and municipalities to replace expensive and inefficient methods of excavation with hydraulic dredging—the cheapest known method of moving water-bound solids.

The development of the Dragon for greater mobility and efficiency in land-locked dredging is another example of how Ellicott is prepared to solve any dredge problem. For example, Ellicott will improve the performance of your old dredge, adapt it to a new job, or design, manufacture, deliver and service a new dredge tailored to your specific needs.

* * *

For more information about the Dragons and other Ellicott dredging services, write for free illustrated catalog 826, to:



ELLIOTT MACHINE CORPORATION
1605 Bush St., Baltimore 30, Md.

ELLIOTT DREDGES



This Dragon 8 removes silt accumulation from a large irrigation canal



BESIDES CUTTING OUT ROADS, Riendeau uses his TD 14 to push his truck and a 15-ton load through quagmire road sections.



RIENDEAU HANDLES BULLDOZER HIMSELF. He says: "I've had first-hand experience with the terrific performance these highest quality Cities Service Products deliver."

New Hampshire Logger Cuts Truck Roads Through Forest!

Oscar Riendeau of Berlin, N. H., has been hauling logs for about 15 years. To get his lumber out of densely overgrown New England forests, Riendeau has to cut his own truck roads. He carves out his twisting, turning truck roads with an International TD 14 Diesel . . . powered by Cities Service #2 Diesel Fuel! . . . lubricated with Cities Service Lubricants!

Says Riendeau: "I use Cities Service Products throughout my operation . . . diesel fuels, lubricants, gasoline, and even tires. These high quality, dependable products have kept my equipment at work full time under really rugged conditions. I heartily recommend them for any earth moving or trucking operation."

Why not try Cities Service Fuels and Lubricants in your operation?

CITIES  **SERVICE**
QUALITY PETROLEUM PRODUCTS

ALL-HYDRAULIC CRANE . . .

Continued from page 124

So far the truck installations are fairly routine—adaptations to conventional trucks where power take-off is available for driving the main hydraulic pump. Outriggers must be used with trucks for safe and efficient lifting over the side.

As part of the development program for this new hydraulic crane, Ed Brown, Austin-Western chief engineer, is working on a self-contained truck unit. This will include an independent 35-hp engine for driving the hydraulic pump, thus eliminating the need for hook-up to power control off the truck engine. This unit will be a package adaptation to any truck of suitable capacity in the form of a complete framework that will bolt to the top of a conventional truck frame.

The tractor carriage unit is in a class by itself. With torque-converter drive, two- or four-wheel steer, two- or four-wheel power, diesel or gas engine, and three tire sizes—all offered as optional—the buyer can get just about what he wants. Three traveling speeds in each direction range from 5.2 to 19 mph, depending upon tire size and type of transmission. Specifications for the tractor unit and safe load charts for the tractor unit are given in accompanying tables. Outriggers are available, both manual and power operated.

Attachments Coming

Austin-Western engineers also look upon the four-wheel tractor unit as a prime mover upon which several standard attachments might be mounted. These include: Bulldozer and snowplow, already available from A-W motor graders; magnet loader, already developed; and clamshell, fork-lift and front-end loader, all lined up for future development.

While admittedly an outgrowth of military models, the Austin-Western hydraulic crane is not merely a happenstance. The company long has had such a unit in mind, and before bringing out the civilian model, had conducted an exhaustive, impartial survey through an independent research organization to determine the feasibility and universal appeal of the machine. The new crane is the answer. With its low overhead height of 9 ft, with boom horizontal, four-wheel steer and short turning radius, the rig is a natural for both inside shop and warehouse work and for outside yard and con-

More And More Manufacturers Are Installing **MARVEL SYNCLINAL FILTERS** AS STANDARD EQUIPMENT

Manufacturers of hydraulically actuated and other equipment with low pressure liquid circulating systems want their equipment to perform consistently with all the productive efficiency they build into the machine that bears their name. Since these systems must be kept free of damaging particles, the selection of a filter is an important factor. Here are some of the outstanding reasons for the increasing preference for Marvel Synclinal Filters to do this all-important job!



SUMP TYPE
(Cutaway)

BECAUSE . . . Marvels are designed to give maximum ACTIVE filter area rather than total filter area. Only ACTIVE FILTER AREA COUNTS!

BECAUSE . . . Marvels greater storage space for filtered out particles allows longer periods of "production" time at absolute minimum in maintenance cost and "down-time".

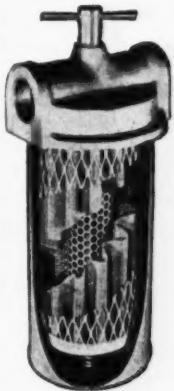
BECAUSE . . . Marvels can be disassembled, cleaned and reassembled by any workman in a matter of minutes.

BECAUSE . . . Marvels (Both Sump and Line Type) operate at full efficiency in any position. Line type may be serviced without disturbing pipe connections.

BECAUSE . . . Marvels are protected and of sound construction to give long life and efficient filtration.

BECAUSE . . . Marvel not only delivers a top grade filter in both quality and performance, but delivers IMMEDIATELY—shipments are made the same day orders are received, if desired.

BECAUSE . . . Marvels (Both Sump and Line Type) are available in individual capacities from 5 to 100 G.P.M. and choice of mesh sizes ranging from coarse 30 to very fine 200, they get a filter to fit their specific requirements.



LINE TYPE
(Cutaway)

**OVER 400 MANUFACTURERS
MAKE MARVEL SYNCLINAL
FILTERS THEIR O.E.M. CHOICE**

FACTS — NOT CLAIMS

Engineers decide on the basis of the record, on the basis of measurable facts rather than claims of the "campaign promise" variety. Here is a fact with meaning:

For Dependable Protection On All Hydraulic And Low Pressure Systems Investigate **MARVEL SYNCLINAL FILTERS**

WATER FILTERS

In response to the great demand, we have adapted both our sump and line models for use in all water filtering applications. No changes have been made in the basic synclinal design.

MARVEL ENGINEERING COMPANY CME-12
625 W. Jackson Blvd., Chicago 6, Ill.

Without obligation, please send me complete engineering data on Marvel Synclinal Filters as follows—

Catalog #106 for Oil Filters
Catalog #300 for Water Filters

Name _____

Company _____

Address _____

City _____ State _____

MARVEL ENGINEERING COMPANY

Phone: Franklin 2-4431

625 W. Jackson Blvd., Chicago 6, Ill.

THE BIG 3

in the LeBus lineup of top flight tools for the truckers are LeBus Truckers Special SNATCH BLOCKS, LeBus "Bull Dog" LOAD BINDERS, and LeBus TAIL CHAINS. For safety . . . security . . . and dependability . . . make sure your equipment is equipped with the Big 3. These tools are completely drop-forged of quality steel and are heat-treated for strength and dependability in service. Your costs can be lowered considerably since all LeBus Tools are guaranteed against any defects and failures in service made in line with the recommended specifications. This alone can save you many dollars since much of the breakage of such tools are not always the fault of the user. Think of the many down-time hours saved when using LeBus all the way. For further information on the Big 3, write for catalog pages #100, #450, and #1000.

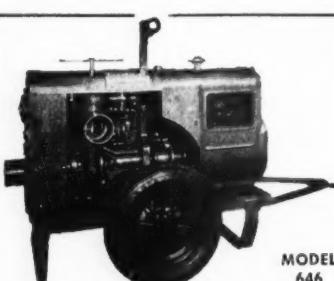


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IT'S HERE AT LAST!

A sure way to save money on your next wellpoint job is to get Foundation's new 4" 1000 GPM capacity pump . . . sturdy, compact, for medium and small wellpoint jobs. Why use big 6" and 8" pumping units and pay big fuel bills when you can use this efficient 4" pump, tailor-made for the job? Economical to operate and maintain . . . easy to move around.



4" unit powered by 4-cyl.
gas engine

MODEL
646

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ALL-HYDRAULIC CRANE . . .

Continued

struction operations. Power steer on all four wheels and single-lever shift full reverse transmission make it as maneuverable as a kid's tricycle.

Specifications

Austin-Western Hydraulic Crane

CRANE

| | |
|-------------------------|-------------|
| Boom reach: min. rad. | 10 ft |
| max. rad. | 24 ft |
| Height, hook to ground: | |
| hor. boom | 6 ft |
| raised boom | 24 ft 4 in. |
| Crowd cyl.: stroke | 96 in. |
| speed fwd. | 32 fpm |
| rev. | 50 fpm |
| Boom lift cyl.: stroke | 23 in. |
| Swing: rotation | 360 deg |
| speed | 3.3 rpm |
| Line hoist: drum cap.: | |
| 1/2-in. line | 95 ft |
| single line speed | 40 fpm |
| single line pull | 6,700 lb |

FOUR-WHEEL TRACTOR CARRIAGE

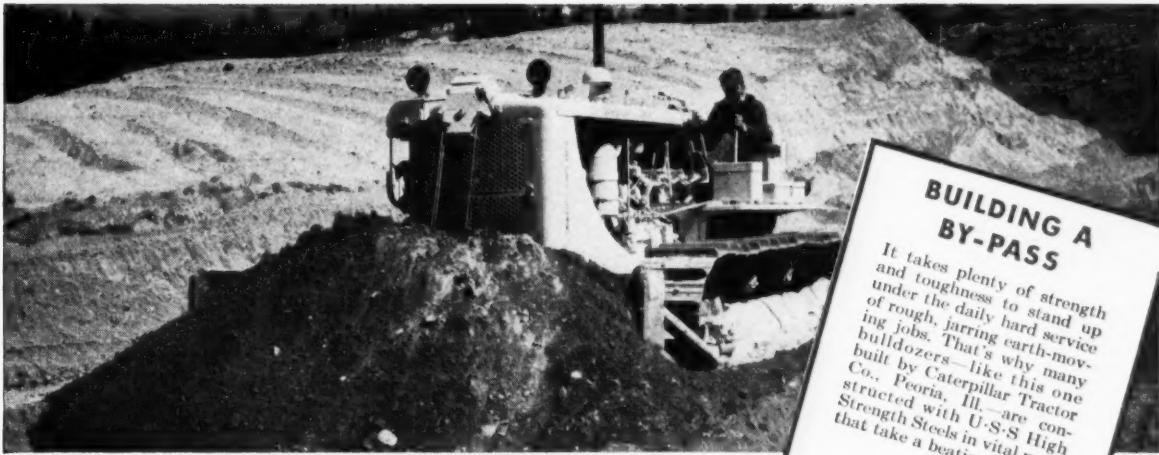
| | |
|----------------------------------|----------------------|
| Wheelbase | 8 ft 6 in. |
| Over-all length: | |
| min. | 18 ft 9 in. |
| max. | 33 ft 3 in. |
| Height: min. | 9 ft |
| Width | 7 ft 9 in. |
| Turn rad.: four-wheel steer | 15 ft 8 in. |
| two-wheel steer | 24 ft 8 in. |
| Wt., including 600-lb cw | 18,000 lb |
| Tires: | 11:00x20 |
| Opt. | 12:00x20 |
| Opt. | 14:00x20 |
| Rear-axle oscillation | 10 in. |
| Transmission | 3 speed fwd and rev. |
| Opt. Fuller 12A torque converter | |
| Drive: | 2 wheel |
| Opt. | 4 wheel |
| Travel speeds, fwd and rev.: | |
| min. low | 5.2 mph |
| max. high | 19.0 mph |
| Engine: International Harvester | |
| U269 gas | 55 hp |
| Opt. | diesel |

SAFE CRANE LOADS

(Tractor Mtd., 15% Safety Factor)

| RADIUS | LOAD IN POUNDS | |
|--------|------------------|--------------------|
| FT | NO OUTRIGGERS | WITH OUTRIGGERS |
| 10 | 9,250 | 10,000 |
| 12 | 6,700 | 8,000 |
| 14 | 5,400 | 6,850 |
| 16 | 4,300 | 6,000 |
| 18 | 3,600 | 5,300 |
| 20 | 2,850 | 4,550 |
| 22 | 2,650 | 4,350 |
| 24 | 2,250 | 4,000 |

NOTE: Truck mounting load limits somewhat less than above.



BUILDING A BY-PASS

It takes plenty of strength and toughness to stand up under the daily hard service of rough, jarring earth-moving jobs. That's why many bulldozers—like this one built by Caterpillar Tractor Co., Peoria, Ill.—are constructed with U.S.S. High Strength Steels in vital parts that take a beating.

Caterpillar Tractor Co. uses U·S·S HIGH STRENGTH STEELS in many types of earth-moving equipment

THE two applications shown here are typical of the many ways Caterpillar Tractor Co. uses U.S.S. High Strength Steels to give extra strength and rugged durability to the high efficiency, heavy-duty earth-movers they manufacture.

In U.S.S. High Strength Steels the design engineers at Caterpillar have found the properties their equipment needs. For with U.S.S. High Strength Steels used in vital parts that take a beating, they can obtain high resistance to wear, impact, fatigue, abrasion and the shattering forces of sub-zero temperatures. Because these famous

"steels that do more" have a yield point 50% higher than ordinary carbon steel, they are used to increase the strength of vital parts without increasing their weight—or, to make those parts lighter, while retaining the same strength as with heavier, bulky carbon steel construction.

To give your equipment the strength, stamina and ruggedness it needs "to stay on the job" why not take advantage of the outstanding properties of U.S.S. High Strength Steels? For more information call or write, on your company letterhead, the nearest District Sales Office of United States Steel.

CLEARING A CLOVERLEAF

To give this highly-mobile track-type shovel the necessary resistance to withstand abrasive action under day-after-day use, the Caterpillar Tractor Co. used U.S.S. High Strength Steel for the two-yard bucket and the box-type cross brace. Greater strength, longer life—at no increase in weight—are assured by the use of this superior, long-wearing steel in place of regular carbon steel. This new "Cat" (the first of its kind) is designed to work around culverts, overpasses and in restricted areas; to handle excavations from initial digging to finished grading, and to serve as a heavy-duty lift fork.

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UNITED STATES STEEL



3-2246



"I REFUSE TO PARTICIPATE in contract negotiations when a lawyer is present representing contractors," says one labor leader.



TABLE POUNDING, SHOUTING and threatening across the bargaining table may be expected, but a better agreement often results.

How to Improve Contractor-Labor Relations

Part 2*...The Unions Make Suggestions

Tricky language often provokes disputes, ruins the good in collective bargaining. Unions need help in jurisdictional matters; construction needs a realistic public relations program.

By LEON B. KROMER, Jr.

"I OBJECT to contractors who try to use tricky language in negotiating agreements so that the unions think they are getting something that they actually don't get." This comes from Richard J. Gray, president of the Building and Construction Trades Department, AFL, who has spent more than 40 yr representing unions at the bargaining table.

He cited as an example negotiations that preceded the construction of a large dam in one of the western states. He was heading a delegation of union representatives to negotiate an agreement with the contractors before work started. During the bargaining sessions he soon realized that "fancy language" made it appear that the workmen would get a benefit, whereas actually they were getting nothing.

Dick Gray called a caucus of the

union representatives and explained exactly what the clause meant. Many on the committee were for walking out then and there. He prevailed upon them to go back and let him do the talking. Then he pointed out to the contractors that they were provoking labor troubles by such tactics rather than trying to settle or prevent them. Either they negotiated fairly and had the contract say what it meant or there would be no agreement. An agreement was reached that could be understood, and the work proceeded with a minimum of labor disputes.

Harry Bates, president of the bricklayers and an AFL vice-president, in discussing contract negotiations expresses it this way, "I refuse to participate in negotiations when a lawyer is present representing contractors." He feels

that lawyers have little understanding of the construction industry and its problems and muddy the waters with legal technicalities. They are more concerned with language than reaching a fair agreement and frequently have been the cause of a complete breakdown in negotiations.

That is what two top building trades union leaders have to say about how contractors may improve their labor relations. It is noteworthy that both emphasize aspects of collective bargaining, as followed by some contractors, which can lead to trouble throughout the life of an agreement.

There may be plenty of table pounding, shouting and threatening across the bargaining table when contractors and unions meet face to face. But a better agreement often is the result. Each pretty well understands the problems of the other, and both know the industry problems in their community.

Officials of many building trades unions are striving to iron out problems of jurisdictional disputes over work assignments. They are at the same time extremely sensitive.

(Continued on page 132)

* Part 1 appeared in *Construction Methods and Equipment*, October 1953, p. 79.

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IT LASTS LONGER . . . That's why Homoflex Hose saves you money. Workmen

like it because they don't have to "fight" it. It's light, flexible, easy to handle, with no pre-set twist . . . and very strong for handling air, water, other fluids and gases. In addition to all this, R/M engineers found a way to make the parts of Homoflex Hose inseparable—adding still more to the life of the hose. If you want to lower your hose costs just raise your standards to Homoflex . . . Ask the R/M Distributor for Bulletin 6879. He'll tell you about other R/M hose types for steam, oil, suction, chemicals . . . also how you get **MORE USE PER DOLLAR** with R/M transmission, and conveyor belt and V-belts.

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BETTER RELATIONS . . .

Continued from page 130

tive over the publicity highlighting union jurisdictional disputes and are quick to point out that general and specialty (sub) contractors have jurisdictional disputes of their own.

General contractors negotiate agreements with one group of the building trades unions; specialty contractors with other unions with which they are closely associated. These relationships often lead to serious jurisdictional disputes on the job site. Who will unload heavy material: the subcontractor who is to install it or the contractor who has the rigging equipment and employs ironworkers?

Who will unload and lay water and sewer pipe outside the building line: the plumbing contractor (employing plumbers) or the contractor (employing laborers) who dug the trench in which the pipe will be placed? These become jurisdictional disputes, not only between the trades but also between contractors.

There is no set solution to the problem which is further complicated by different practices prevailing from one area to another. One method may be that local chapters of associations can set up inter-association committees to deal with the problem as it affects their area. For example, a committee made up of representatives of the general contractors association, plumbing and heating, electrical and any other groups in the locality can work out procedures to eliminate such jurisdictional friction between contractors.

Joint Action

Associations have established successful joint committees in the past for various purposes. Cooperative committees of contractors' groups to further the elimination of jurisdictional disputes for the benefit of the entire industry should have similar results. To a great extent such a method has worked on a national level through the National Joint Board. Representatives of general and specialty contractors' associations sit on the Board and pass upon disputes.

What are unions doing and what more can they do to avoid union jurisdictional disputes that lead to strikes? Joe Keenan, secretary-treasurer of the Building and Construction Trades Department and a bitter foe of jurisdictional strikes, has this to say: "Strikes over juris-

dictional disputes are all wrong. We've got a National Joint Board to settle this sort of trouble, and we are going to use it." He has been one of the leaders in smoothing out the Board's troubles for more effective operation and in bringing back to the Board international unions that withdrew.

Taking further steps to prevent jurisdictional strikes not long ago, the 19 presidents of the international unions agreed upon a policy resolution forbidding picketing over jurisdictional disputes. It went beyond this in directing other unions to ignore a picket line should one be established because of this type of dispute.

Also, heads of international unions have been working together



WHO UNLOADS a heavy generator, electricians or the ironworkers? Union area representative stepped in to iron out dispute.

to reach agreements on longstanding jurisdictional disputes. Only recently the carpenters and ironworkers reached an understanding on the installation of conveyors and material handling systems (CM&E Aug. 1953, p. 85)—work which frequently in the past has caused serious disputes. Final agreement came only after months of negotiations between the presidents of the two unions. These unions and many others continue to work toward agreements on items of work which long have been in dispute.

While it cannot be expected that jurisdictional disputes will be eliminated entirely, these steps taken by the unions will help to prevent stoppages of work over this type of dispute.

However, more effort must be expended by the unions in bringing about agreements on work still in dispute. Unloading of material and

(Continued on page 135)

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your own
equipment...



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features of the

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Our claims as to the performance of our detachable gooseneck trailer are so unusual as to arouse skepticism in some instances . . . a fact which we can well understand.

So, realizing that "to see means to believe," we have equipped a demonstrator which is traveling the country actually handling loads for contractors, movers and erectors.



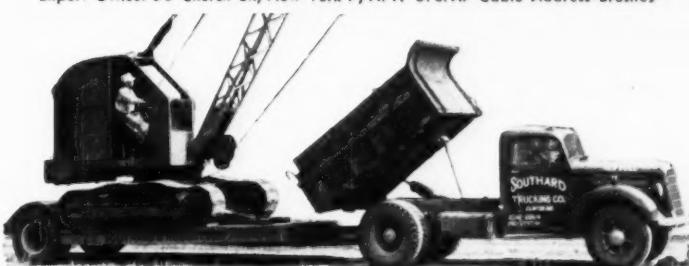
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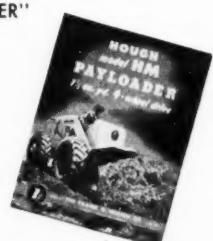
Rear-wheel drive Models HY —

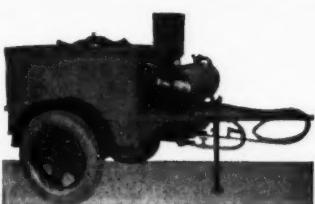
1 1/4 yd., HFH — 1 1/8 yd.,

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BETTER RELATIONS . . .

Continued from page 133

equipment still poses a serious problem to many contractors. A contractor building a large mill faced such a dispute when an electrical generator weighing more than two tons arrived by flat car at the job site. Obviously it would have to be unloaded by crane. Immediately arguments arose between the ironworkers and electricians as to who would unload it.

The electricians walked off the job when the contractor decided that due to its weight and bulk the ironworkers should unload the generator. The electricians returned two days later after intervention by the union's area international representative. It was finally agreed that the ironworkers would unload and move the generator from the car to the storage area and the electricians would handle it from there to its foundation in the building.

As it happens, the presidents of the electricians and ironworkers unions are attempting to settle the jurisdiction over the unloading of all heavy electrical equipment.

Unions can also clarify agreements that already exist. Some of the jurisdictional award decisions and agreements of record published in the famous "green book" by the Building and Construction Trades Department are subject to varying interpretations.

Varying Interpretations

For example, the agreements between the boilermakers and ironworkers, and boilermakers and plumbers and steamfitters covering construction of boilers, refinery equipment, tanks, and related items can be interpreted variously, depending upon the union claiming the work.

A decision of record awards the installation of "bishopric board" to lathers when applied as a substitute for lath; to the carpenters when used as sheathing. Other materials have long since been developed to serve the same purpose as bishopric board yet the local unions will not, in many cases, follow the principles in this decision when such materials are used. The decision could be made more inclusive.

By the very nature of the construction industry, local unions are prone to strike over jurisdiction of work. Their feeling is that if they don't stop the job, the work in dis-

(Continued on page 139)

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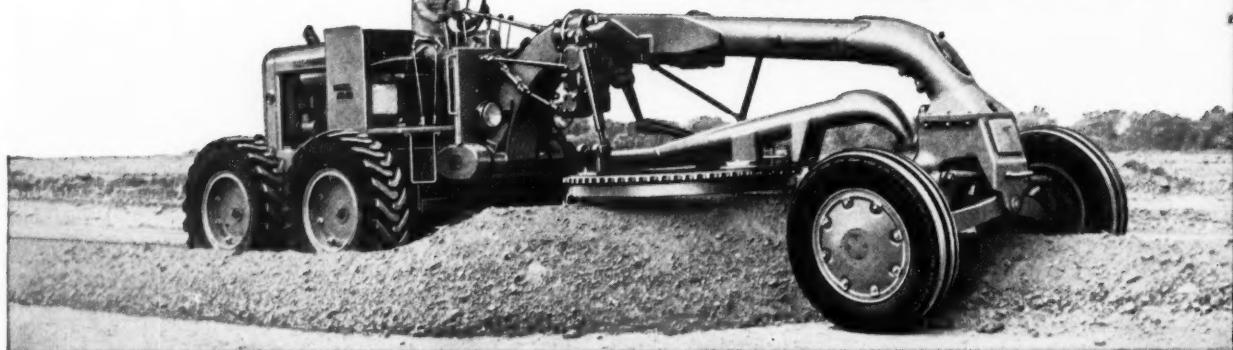
ALLIS-CHALMERS INVITES YOU TO . . .

Look at Your Grader Jobs

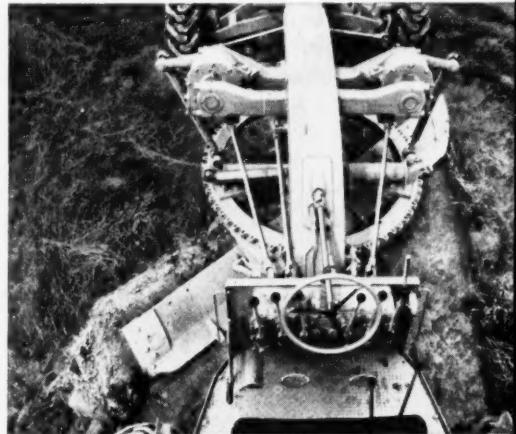
THROUGH THE EYES OF AN

AD-40

OPERATOR . . .

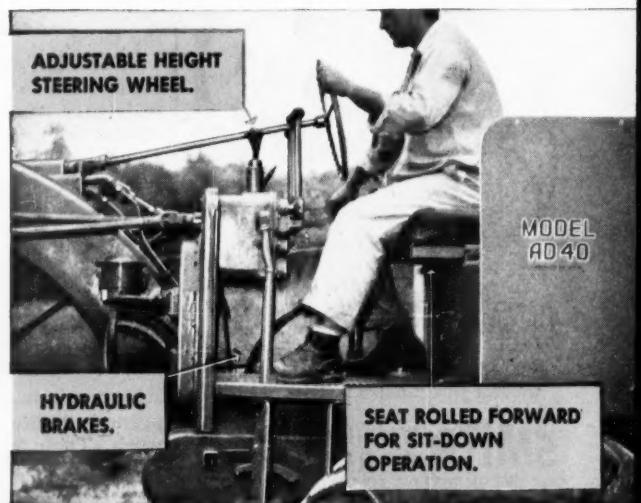


SLOPING — Look how much better you see . . . how much steadier your blade is with small control rods leading out to lift cases located directly over the circle.



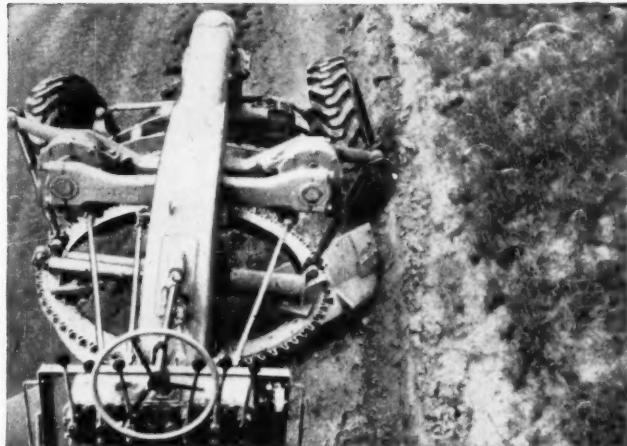
SOD STRIPPING — Look at the tapered corners on this clean, wide platform . . . how they give unequalled view of heel of ROLL-AWAY moldboard.

In addition to letting you see better, the AD-40 offers feather-touch hydraulic power steering, hydraulic brakes . . . and true comfort for any size operator, sitting or standing. *Look!*

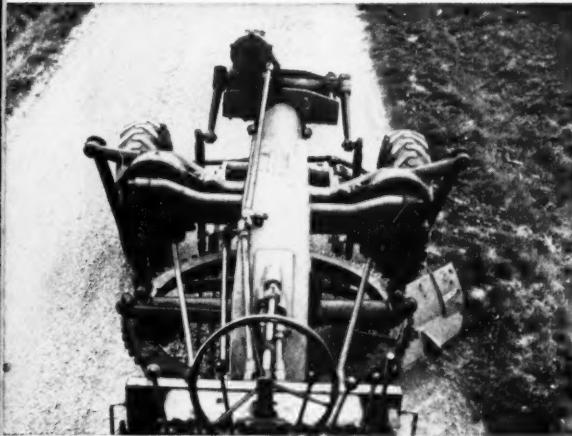




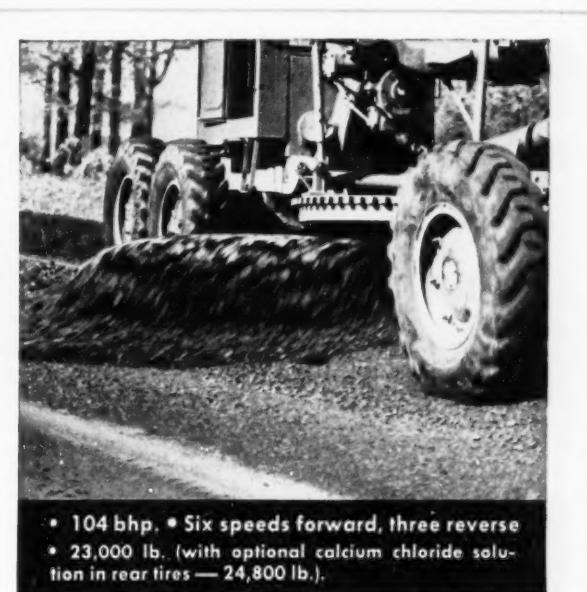
GRADING — Look at that single member frame — it really lets you see what you're doing . . . means efficient grading on *any* job.



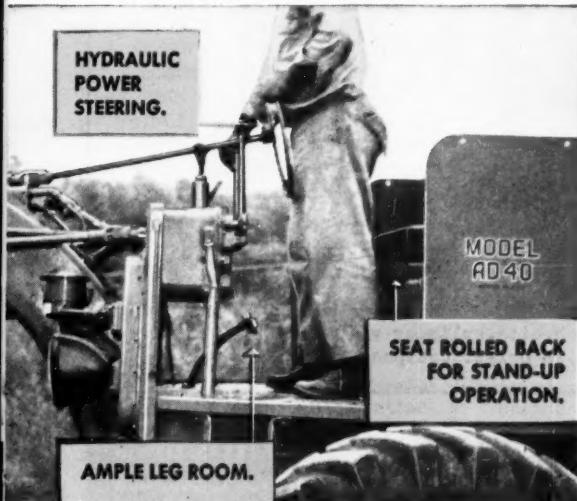
DITCHING — Look at the low control panel. It gives you a clear view of the blade . . . helps insure a clean, smooth ditch.



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- 104 bhp.
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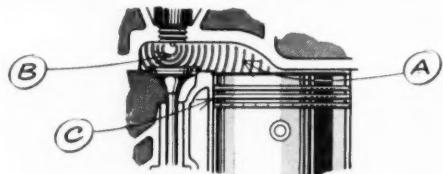
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THE CALIFORNIA OIL COMPANY, Barber, New Jersey • THE CALIFORNIA COMPANY, Denver 1, Colorado

BETTER RELATIONS...

Continued from page 135

pute will be completed before any decision is rendered. In an industrial plant the disputed work is a continuing process, and mediation or arbitration can take place without the pressure of time. Such is not the case in construction. Pipe is laid, machinery unloaded and installed in a matter of a few days.

To overcome jurisdictional strikes requires restraint in which few business agents can afford to indulge under strong pressure from their members to claim the work. Sometimes the pressure takes the form of directions from the international union. However, more action by international presidents to implement the thinking of Joe Keenan and more education of business agents on the other means available to resolve this type of



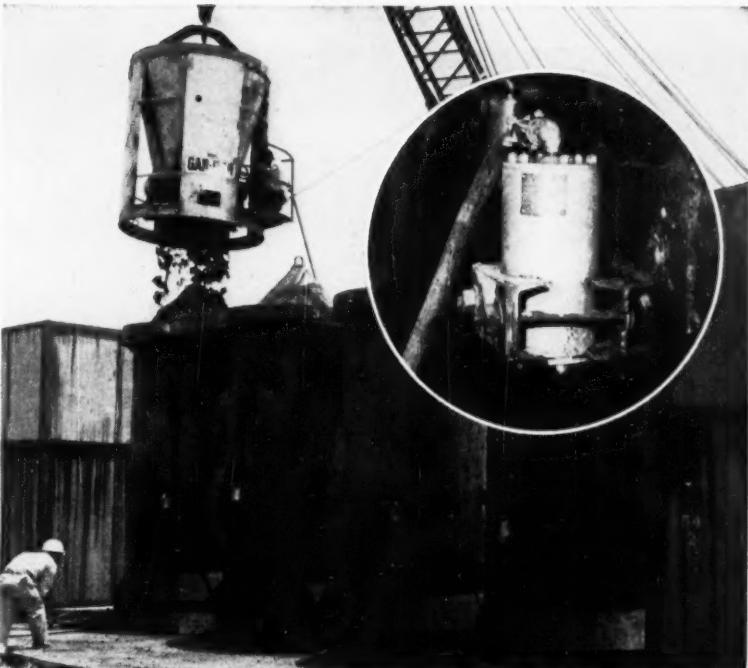
LOCALS STOP WORK in dispute to prevent completion of job before decision is reached.

dispute is essential to avoid jurisdictional work stoppages. With this goes development of a sense of their responsibility as union leaders to the contractor faced with a dispute.

A strike involves heavy losses for a contractor. His loss in overhead costs when no work is being performed cannot be made up nor in many instances can a tight completion schedule be met. If a project is delayed beyond the completion date, the contractor frequently is faced with penalty payments under his contract with the owner. The men's wages can be made up and, if overtime is required, at a further cost increase to the contractor.

Can anything be done about featherbedding—forcing a contractor to hire men he doesn't want and doesn't need?

It would be difficult to estimate



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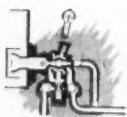
FINISHING JOINT SURFACES is easy with a final touch of internal vibration. This 22 lb. VIBER vibrator with 14 inch flexible drive removes air pockets and gives smooth joint surfaces.



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Talk to operators of Baker-equipped A-C Tractors . . . you'll find they prefer the easy, natural operation of *Baker* Fingertip Control. With the exclusive Baker control-valve system, they can hold the blade in any position—without settle or "suck in." Result is *better work*—done with *less fatigue*.

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With excess linkage eliminated, Baker Blades are *rigid* and *rugged*—with *fewer moving parts that work better and last longer*.

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BETTER RELATIONS . . . Continued

the additional cost of construction to contractor, owner or taxpayer as a result of this practice. Its roots are strong and stem from periods in the past of widespread unemployment in the building trades. Union officials at such times are harassed to find work for the men sitting around the union hall. One solution is to force men on to jobs that are under construction.

Even in periods of high employment and actual shortages of men, union leaders are reluctant to give up featherbedding. They remember the thousands of men unemployed during the pre-war depression and don't rule out the possibility of another. One union man expressed it this way: "If we give up any of it now, we will



IN BAD TIMES men sit around union hall, harass labor officials to find work for them.

never get it back." The unions do not want to run that risk.

What can be done? First, an acceptance by unions of the existence of the problem. It is doubtful that any top leader would admit that featherbedding is a major industry problem. Yet he must admit that the man receiving 8-hr pay for standing by a compressor to switch it on and off twice a day, or a gang of seven when five men would be enough, and other make-work jobs are not essential to a job's progress before steps can be taken to eradicate the problem.

International union officials must lead the way before local unions will follow and give up many unnecessary jobs. In the end their men would benefit. Elimination of all unnecessary jobs means lower construction costs which could mean more construction work—more jobs for the men.

Collective agreements frequently
(Continued on page 167)

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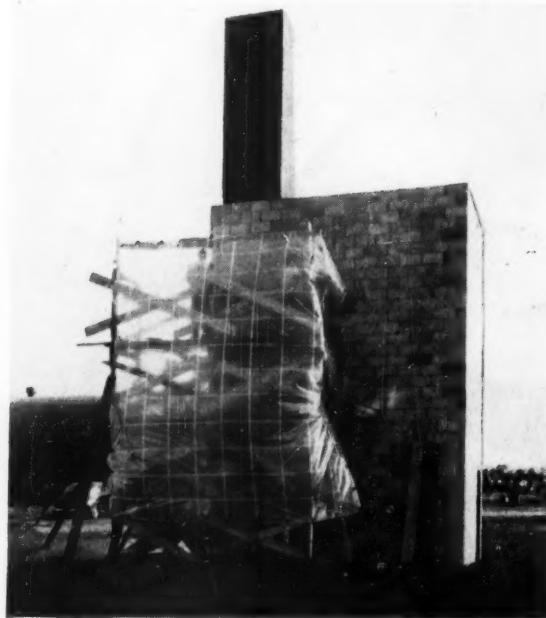
★ Heavy diesel crawler tractors as shown above are also offered protection by Tousey. Ingredients from an ever-increasing production line are used in the mixing of the brilliant red finish that resists punishment from rocks, sand, water, weather, heat and vibration. ★ Take advantage of this 2-way protection—specify and insist on finishes by Tousey.



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CONSTRUCTION EQUIPMENT NEWS



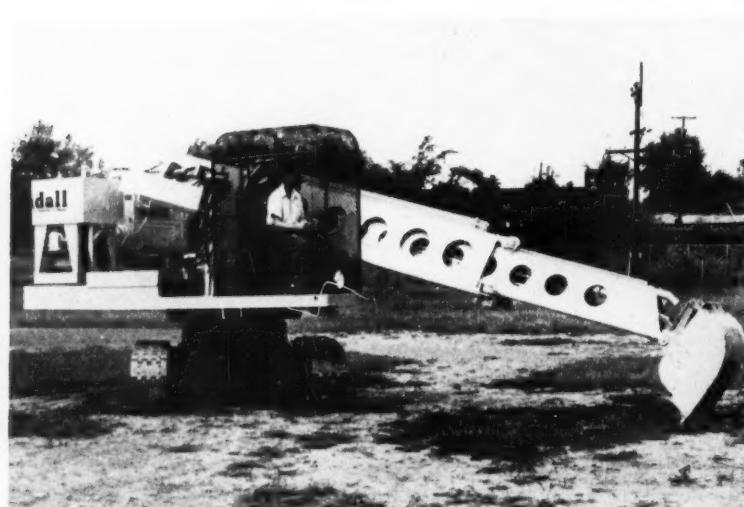
Lightweight Transparent Windbreak

Here's a windbreak made from polyethylene that stays flexible even in temperatures of 78 deg below zero. Its light weight makes it easy to handle on high scaffolding. It is available in standard and custom sizes and comes reinforced every 12 in. with Fiberglas. Edges are grommetted every 18 in.—**Canton Containers, Inc., Canton 7, Ohio**



Hydraulic Angular Bolt Cutter

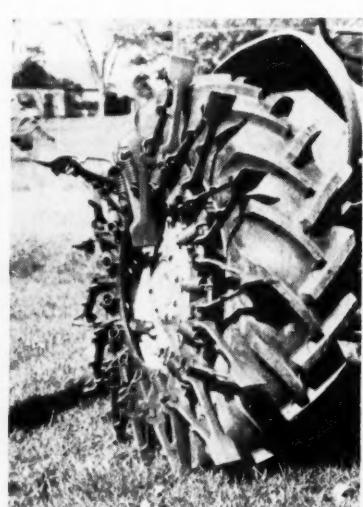
For flush trimming bolts up to $\frac{7}{8}$ -in. mild steel to the nut or for other metal trimming where a close cut is desired, this new hydraulic angular bolt cutter is the latest in the Guillotine line. Power is supplied through a portable hydraulic pump. The unit can be obtained with cut back jaws for splitting nuts or trimming wire mesh.—**Mango Mfg. Co., Bradley, Ill.**



Gradall Now on Crawlers

Developed to further broaden the application versatility of the Gradall, the newest machine is now on crawlers. It has two speeds—one half and one mph. The en-

tire unit is driven by hydraulic pressure. This machine, with screen cab, was designed for underground work.—**Warner & Swasey Co., Cleveland, Ohio**



Lugs Give More Traction

Wheel-type tractors can get more traction with these Miracle Traction lugs. The lugs fold out of the way when not needed.—**Baraboo Mfg. Corp., Baraboo, Wis.**

S

On-the-Job Previews of Machinery, Tools and Equipment



Miniature Snow Remover

Here's a snow plow suited for work around plants, storage areas, sidewalks, etc., that attaches to the front end of wheel-type tractors and will get rid of snow at the rate of 3 to 4 tons per min. It will plow widths from 4 ft, 6 in. up to 6 ft, 6 in. No extra braces nor drilling are required to attach the unit.—**Wm. Bros Boiler and Mfg. Co., Minneapolis 14, Minn.**



Twin Compactors Operated by One Man

This Twin-Compactor unit, comprised of two standard Jackson Vibratory Compactors with 26-in. bases, is self-propelled and can be operated by one man. The manufacturer claims units deliver up to 4,500 1 1/4-in. blows per min. Power comes from trailer which is also used to transport the unit.—**Jackson Vibrators, Inc., Ludington, Mich.**



Slabs for Roof and Floors

Rapidex sectional slabs used for roof and floor construction are made of fine and coarse Haydite aggregate and portland cement. The units have a tongue-and-

groove joint, which permits the deck to become an integral slab. The reinforced slabs are said to have great strength.—**The Spickelmier Co., Indianapolis, Ind.**

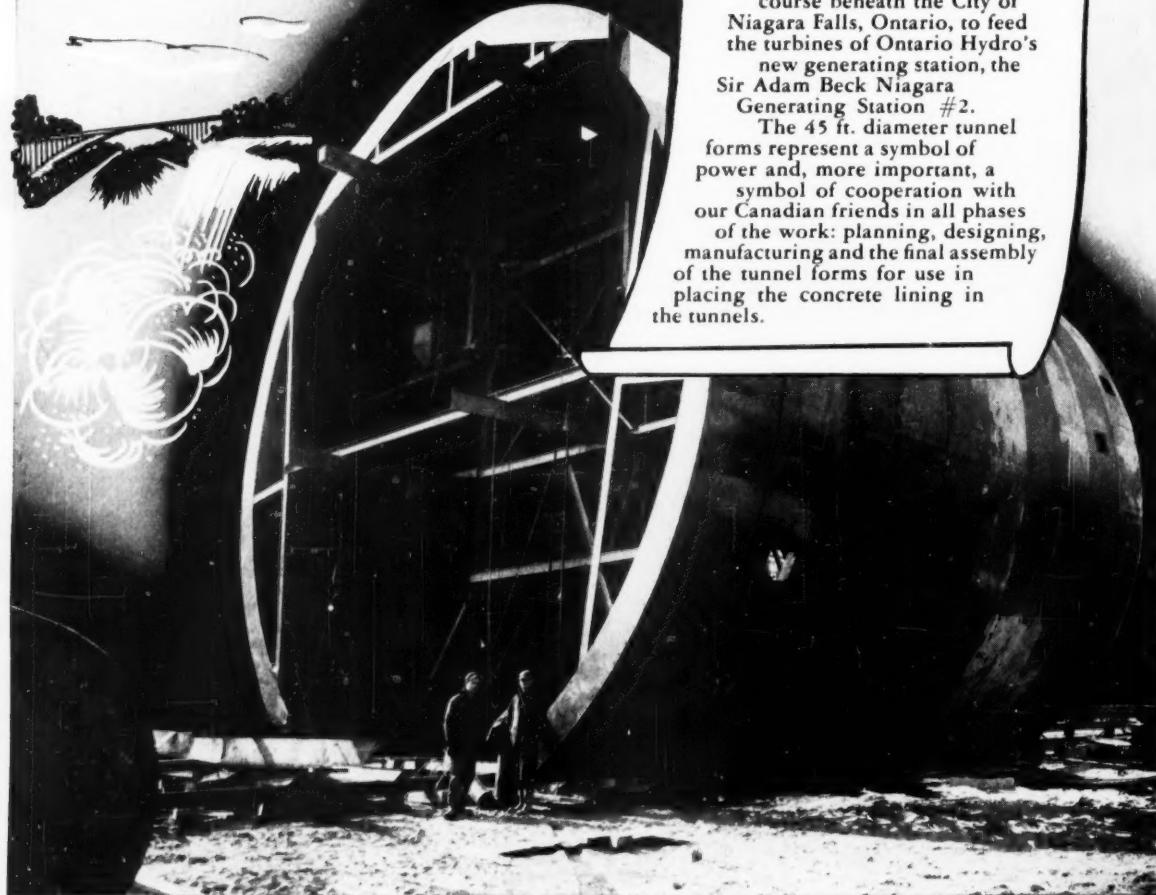


Portable Ladder

The Porta-Fold, a lightweight portable ladder for use by painters, electricians, carpenters, contractors, etc., has been designed by

(Continued on page 149)

*Blaw-Knox Steel Forms help build
the biggest long tunnels and
the longest big tunnels
in the world!*



They're Blaw-Knox Steel Forms, of course, for the gigantic twin tunnel project to convey Niagara River water on a five mile course beneath the City of Niagara Falls, Ontario, to feed the turbines of Ontario Hydro's new generating station, the Sir Adam Beck Niagara Generating Station #2.

The 45 ft. diameter tunnel forms represent a symbol of power and, more important, a symbol of cooperation with our Canadian friends in all phases of the work: planning, designing, manufacturing and the final assembly of the tunnel forms for use in placing the concrete lining in the tunnels.

.... for every concrete placing job use
BLAW-KNOX STEEL FORMS!

WHATEVER your concreting job . . . big tunnels, dams, bridges, or concrete installations of any kind . . . follow the lead of the builders of the Sir Adam Beck Niagara project. Call in Blaw-Knox engineers for the expert consultation service that assures efficient forming methods and results in close scheduling and fast progress in the concrete placing.

Blaw-Knox engineers, with over 40 years experience in solving tough or unusual concreting problems, get right to the heart of your problem, find the simplest, most economical method of solving it, and recommend the Blaw-Knox Steel Forms best suited for the job.

Get complete details today about the advantages of Blaw-Knox consultation service in the *preliminary* planning stage. Send for Bulletin 2035 today, or if you want detailed information fast, wire or phone.

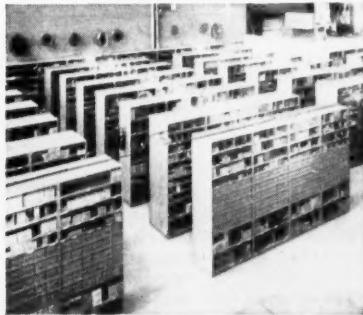
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Construction Equipment Distributor Helps User to Bigger Profits

The construction equipment distributor has played an important part in helping to build the vast construction industry as we know it today. Too often the services of the distributor are taken for granted, but these services have much bearing on the contractor's profit and success.

The role of the distributor begins when a job is bid. He provides facts and figures on a moment's call on most any equipment. He stocks machines for prompt delivery. He knows job conditions within his territory and helps in



Parts-in-stock — a time-saving, cost-cutting Distributor service.

applying proper equipment for lowest operating cost. When a sale is made, he arranges the financial plan. Many a contractor has been given his start and guided down the path to prosperity by an intelligent and helpful distributor.

When the equipment goes to work, his role becomes increasingly important. The distributor's parts and service facilities can often mean the difference between profit and loss to the contractor. Genuine parts stocks are close to the job. Shop facilities are specialized for equipment service. Field service on-the-job adds countless hours of performance time. Distributor parts and service personnel bring factory approved methods to the equipment owner for lower costs and best results. Machine records are maintained to further speed customer service.

When you think of your equipment distributor, consider all of the things he offers to make the contractor's work more profitable. He is not only a selling agent, but an organization of specialists very closely geared to every phase of a construction project. Without the construction equipment distributor, the present day contracting industry as we know it could hardly exist. Hats off to one of the industry's most important groups!

LOOK AT THESE **LORAIN-50** PROFIT BOOSTERS



HYDRAULIC COUPLING — Prevents shocks and stresses from backing up into mechanism and cables—reduces maintenance—increases output. No stall under any digging condition. Standard on only this 1-yard machine.

AIR CONTROLS — Air does the work on the "50" — crawler steering and Tread-Travel Lock use full air power. Air-assist available on hoist, crowd and retract.

4 CRAWLERS — Be "choosy" about your crawler. Select from standard, long, extra-long, and extra-long & extra-wide — to exactly fit your job. Rubber-tire mountings also available.

5 FRONT ENDS — Choose from shovel, crane, clamshell, dragline and hoe—all interchangeable. Your "50" can help you win many bids.

ANTI-FRICTION BEARINGS — Tapered anti-friction turntable rollers—anti-friction bearing mounted Swing Drums—anti-friction bearing mounted Hoist Drums.

Be "CHOOSY" when you buy a Shovel-Crane

Times have changed! Today, you can get most *any* brand you want—when you want it. Not long ago, perhaps you bought just any make of shovel-crane "because it was available". Now you can return to *selective* buying to get the most for your money.

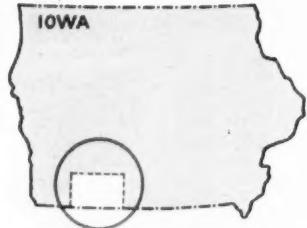
In the 1-yard Lorain-50 "Series" shovel-crane class, as well as in the rest of the wide Lorain line, there are solid values and exclusive design features that pay off in profits. They are not just "gimmicks" to confuse the buyer—but are an honest-to-goodness combination of values that you won't find in any other 1-yard class machine.

Be "*choosy*". Make sure your shovel-crane investment will pay you greatest profits. Choose from the complete Lorain line—from $\frac{1}{2}$ to 2-yard classes—at your Thew-Lorain Distributor.

THE THEW SHOVEL CO., LORAIN, OHIO

1-YARD
THEW
LORAIN. **50** **CLASS**

Taking Iowa



RINGGOLD COUNTY has 935 miles of county roads. This is the location of farm to market road construction done by the International Crawler fleet of Easter & Schroeder, Inc.

**Pick Your Site and Set Your Hour...
We'll Demonstrate Our Tractor's Power**



"IDEAL FOR FARM-TO-MARKET ROAD CONSTRUCTION," say Joe Easter and Don Schroeder (above). "In our eight month's working season, our five TD-18A units, with the sixth as a pusher, moved approximately 540,000 cubic yards, with minimum downtime."



ROAD BUILDING PRODUCTION LINE! Part of the Easter & Schroeder fleet of International crawlers on a regrading job in Ringgold County, Iowa. On this seven-mile stretch they moved 78,000 cubic yards in three weeks' time. "We move it that way all the time," say the owners.



to Town

Farm-to-market roads get big boost fast from the International Crawler fleet of Easter & Schroeder, Inc.

The dirt flies when Easter & Schroeder, Inc., move in with their fast, powerful fleet of International crawlers . . . and Iowans can get to town and back in time to do the milking. For these Griswold, Iowa, contractors specialize in farm-to-market roads in the tall corn state.

Take the seven-mile job in Ringgold County, Iowa, you see here. In three weeks' time, Easter and Schroeder moved 78,000 cubic yards of dirt to give the road a 24-foot top on a 66-foot right of way.

Easter and Schroeder came to this Ringgold County job from one in Taylor County, where they moved 35,000 cubic yards of dirt on a two-

mile stretch, completing the job in six 11-hour days.

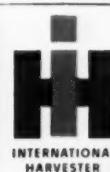
"After 25-years' experience working in dirt, we settled on a crawler fleet one hundred per cent International," say these contractor partners. The fleet now consists of six International TD-18As with scrapers and 'dozers and a TD-14A with tamping roller.

Do you want speed and dependable economy under tough conditions? Then get in touch with your International Industrial Distributor, for all the facts on Power that Pays!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

POWER
THAT PAYS

INTERNATIONAL

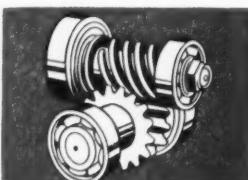


EVEN GREAT INTERNATIONAL CRAWLERS... EACH WITH
MATCHED EQUIPMENT FOR EVERY JOB

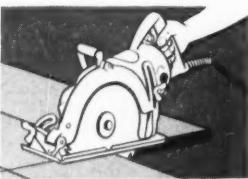
"We cut over a million board feet yearly with eight SKIL Saws"



You Can See the Cut with a SKIL Saw. Easier to use, insuring greater accuracy. Both the cutting edge of the blade and the sighting mark are always in view.



Worm Gear Transmits Tremendous Power for tough on-the-job cutting. Maintains speed under heavy loads; reduces motor maintenance.



Easier One-Hand Operation. Rear handle utilizes easy normal guiding motion of user's arm. Sturdy base supports tool on both sides of blade for maximum stability; enables cut-off at either end of lumber.

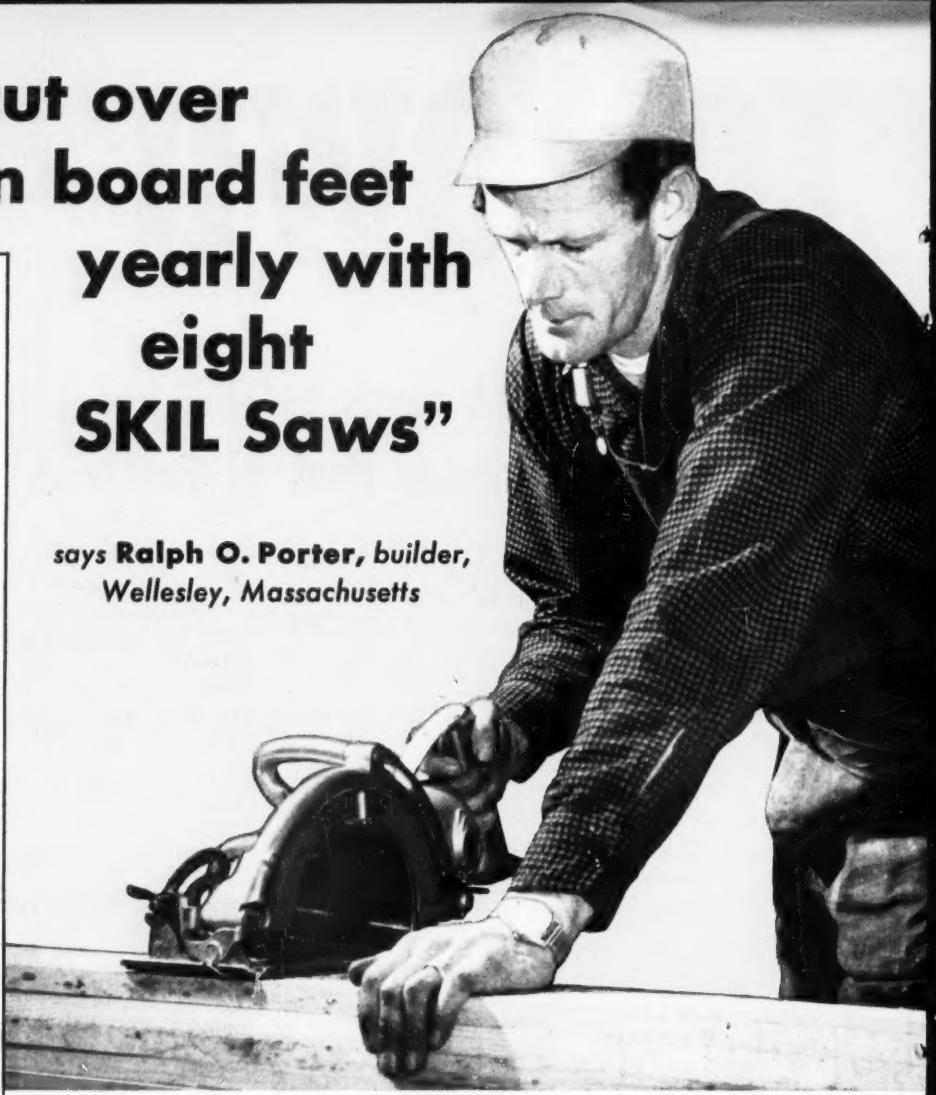


Awkward Cuts No Problem with two handles. Safest in any position, SKIL offers perfect balance, surest control. No other saw so easy to use! Faster, easier depth and bevel adjustments make the SKIL Saw ideal for framing cuts—joists, studs, sub-flooring, sheathing, all rafters.



High Torque Performance allows cutting of concrete blocks, other kinds of natural and cast stone with abrasive disc. Sheet and corrugated metals cut easily with special blades.

**says Ralph O. Porter, builder,
Wellesley, Massachusetts**



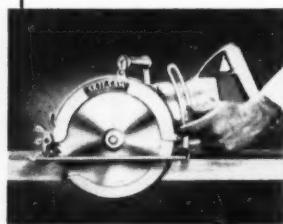
"We've standardized on SKIL because of the blade position, worm gear and other features that give us fast, accurate, heavy-duty cutting.

"SKIL Saws have helped beat high production costs and the men can put out more work. No other saw we've tried measures up to SKIL," concludes Mr. Ralph O. Porter.

Builders everywhere say the SKIL Saw is a marvel in performance, efficiency and convenience. It is a tool that

requires little maintenance. It is a tool you can buy reassured by Factory Branch Service in all principal cities to render instant attention—should it be needed.

And when you have examined all the features of this great saw, you will see why there are more SKIL Saws in use than any other make. Naturally, your good business judgment will tell you to ask for a demonstration before you buy your next saw.



HEAVY DUTY THROUGHOUT

— gears, shafts, all ball bearings. Sturdier castings and feet. Longer tool life, far greater ability to take all the punishment you can give it! SKIL features include oil lubrication that acts fast even in cold weather.

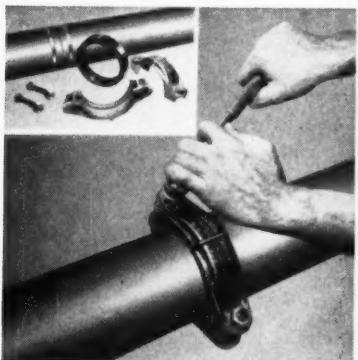
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See Your SKIL Distributor or Call Your Nearest SKIL Factory Branch for Information
About the Complete Line—10 SKIL Saw Models—6" to 12" Blade Diameters

CONSTRUCTION EQUIPMENT
NEWS . . . Continued from page 143

a West Coast contractor. Fashioned from aluminum and hardwood, the ladder weighs only 36 lb, but will hold more than 1,000 lb. Collapsed, the Porta-Fold folds down to 9x15x44 in. and extended makes a 14-ft utility ladder or a 7-ft step-ladder. It can also be used as a work scaffold.—**Porta-Fold Co., Los Angeles, Calif.**



COUPLING FOR GROOVED PIPE—A lightweight coupling for grooved pipe systems called Gruvajoint has been designed to save time, weight and space in coupling grooved pipe systems where pressures do not exceed 500 lb per sq in. The new coupling, it is claimed, automatically absorbs expansion and contraction shock, ground motion, and vibration. It remains leakproof under end pulls up to 7,500 lb, permits layout misalignment up to 3 deg, and will withstand temperatures from 65 deg below zero up to 200 deg F. It can be applied or removed in approximately 1 min. and is available in 2-, 3-, and 4-in. sizes.—**Gustin-Bacon Mfg. Co., 210 W. 10th St., Kansas City, Mo.**

NEW BLACK-TOP PAVER—The Model 8 Adnun Jr. Black-Top Paver is claimed to be a better-built, economical bituminous paver with many outstanding features. The manufacturer says it has a big, roomy hopper with low-set raker bar for better compaction, dual controls, anti-friction bearings, oscillating cutter bar to cut off pavement but not scrape it, overlapping cutter-bar action for carrying material and compacting with the parallel course, continuous course correction, new-type, self-equalizing, easily attached truck hitch and a heavy-duty, removable long-distance towing hitch. It is powered with a 12-hp Hercules 2CB engine, and working speeds are up to 40 fpm. Complete details on this unit can be obtained by asking for bulletin BT-7153—**Blaw-Knox Co., Foote Construction Equipment Div., Nunda, N. Y.**

**THERE'S A
MALSBARY STEAM CLEANER TO
MATCH YOUR
WORK LOAD**



Here's how others use them . . .

Equipment Distributor (above)—"For five years, our MALSBARY 300 has averaged 45 hours weekly, winter and summer, doing heaviest industrial cleaning and degreasing," reports Geo. W. Crothers, Ltd., Toronto.

Open Pit Mining—Fast action of MALSBARY 250 makes it practical to steam clean "crawlers" once every 24 hours, blast away abrasive grease, mud and iron ore from tracks, thus increase roller life from 1200 to 2400 hours in Mesabi Range.

Contractor—Mud freezes overnight in uncleared scrapers on an Ontario winter job, causes cable breakage and costly downtime. Two MALSBARY 250's solve the problem for King-Brenaman by steam cleaning 47 big rigs nightly.

Sewage Plant—MALSBARY Series 500 and 300 units steam clean scum, dirt and grease from walls, sedimentation and digester tanks, and melts sludge in connecting pipes for San Francisco and Oakland treatment plants.

6 Sizes—No matter what your cleaning work load, there's a MALSBARY tailored to your exact needs. Choice of steam vapor and heavy duty cleaners from—

- 100 to 400 lbs. pressure
- Operating temperatures:
 tap water to 325°F.
- 100 to 2100 gallons per hour

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but wear . . .

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more VERSATILITY Bullgrader blade can be set straight ahead, angled right or left, or tilted vertically — no special tools required. Tilting bulldozer blade can be adjusted as much as 16 in. above opposite end.

more PAYLOAD CAPACITY Scientifically curved mold-board rolls dirt instead of pushing it — builds up bigger loads on every pass while using less tractor power. Bucyrus-Erie blade equipment fully harnesses the superior power of the International TD-24 tractor.

more VISIBILITY AND CONTROL Front or rear mounted winches have improved planetary drive, give operator instant-response control over blade. Exceptional visibility lets him accurately gauge his work for fast, clean dozing.

less WEAR Tough, wear-resistant steels prolong the life of Bucyrus-Erie blades. Proper weight distribution with careful balance of blade to tractor puts full tractor power to work with less wear and tear on all parts.

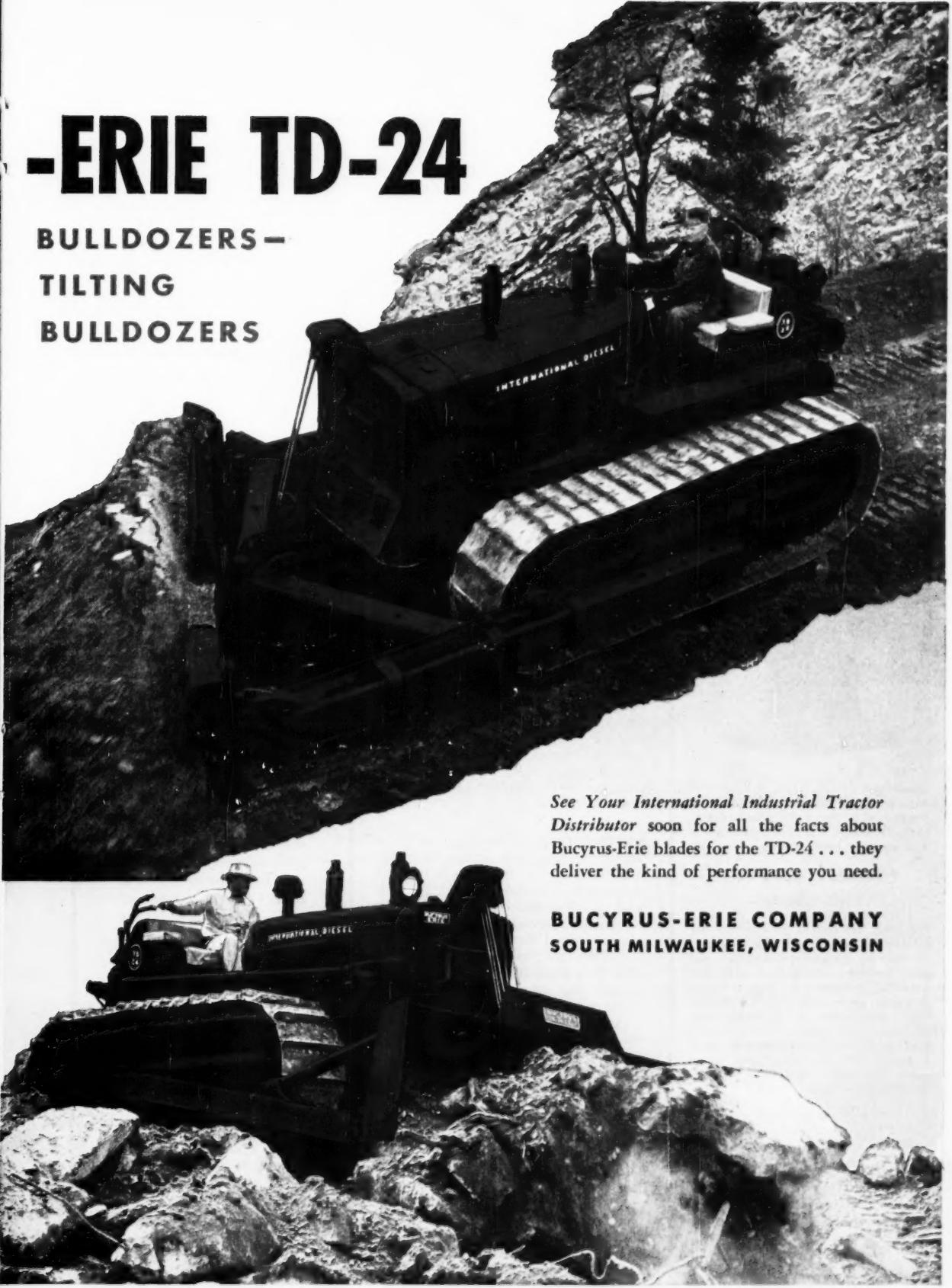
15T53C



**BUCYRUS
ERIE**

-ERIE TD-24

BULLDOZERS—
TILTING
BULLDOZERS



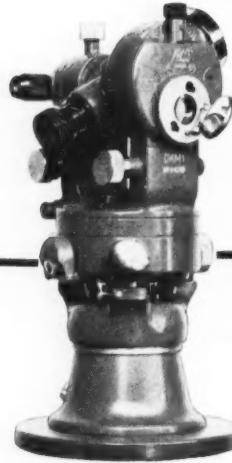
See Your International Industrial Tractor Distributor soon for all the facts about Bucyrus-Erie blades for the TD-24 . . . they deliver the kind of performance you need.

**BUCYRUS-ERIE COMPANY
SOUTH MILWAUKEE, WISCONSIN**



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Sturdy as a pioneer's arm and infinitely more accurate than the most wonderful frontier rifle—the Kern DKM1 double circle theodolite is a superb example of Kern's master craftsmanship.

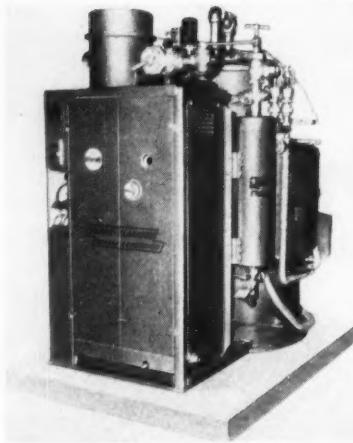
PORTABLE, ACCURATE AND TOUGH!

Featuring an optical micrometer, the DKM1 is an exceptionally fine theodolite. In addition, compactness, lightness and great precision combine to make this a superior instrument for large construction sites, engineering work, supplementary triangulations, and exploratory expeditions in all climates. You get direct readings to 10 seconds, interpolation to 1 second, 20× telescope and coated optics throughout. Send today for fully illustrated brochure!

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STEAM GENERATOR—A new vapor Clarkson steam generator Model OKJ-4740, capable of changing from fuel oil to natural gas fuel by the mere flip of one switch without interrupting steam output, is now available. This generator could be particularly useful in areas where natural gas fuel is available only part of the time. The unit develops full working steam pressure up to 300 lb in less than 3 min in cold water and makes 1,500 to 5,000 lb of steam per hr. It is said to be more than 80% efficient. Once the unit is started by turning the one switch, automatic controls take over, causing the steam generator to turn on and off and modulate steam output to meet a changing demand. It is a complete package which includes 7½-hp electric motor, blower, feedwater pump, steam separator, steel coils, and all controls located in a single cabinet. Dimensions are 50 in. wide, 80 in. high, and 73 in. long.—**Vapor Heating Corp.**, 4501 W. 16th St., Chicago 23, Ill.

FACING TILE—A new line of load-bearing facing tile is the Uniwall. According to the manufacturer, this product makes possible single-unit wall construction with finished facing inside and out. The exterior finish is natural Buff Range Unglazed Rug-Tex, and the interior surface is ceramic glazed. They are made with a jamb slot to receive the fin of a metal window or the blind stop extension of a wood window. Modular dimensions apply to all unit sizes, but they are equally adaptable for non-modular construction. With allowances for ¾-in. mortar joints, the nominal dimensions of Uniwall tile are: Wall thickness, 8 in.; face size 4x12 in. Corner and jamb units are of corresponding nominal dimensions. Interior ceramic glazed facing units are 2x4 in. in thickness with nominal 4x12-in. face dimensions. Shapes are available to meet all normal building requirements.—**Nateco Corp.**, 327-29 Fifth Ave., Pittsburgh 22, Pa.

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The touch of a fingertip, the infinitesimal difference in instrument balance... upon delicate qualities such as these, lies the world wide fame of Kern drawing instruments. Each instrument a gleaming tribute to craftsman and user, Kern drawing instruments represent the culmination of the most exacting traditions in the world.

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Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.

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• In this **NEW** 16-page booklet, HAZARD makes it easy for you to select the best, the correct wire rope for every piece of equipment used by general contractors.

You'll find large photographs of crawler cranes, clamshells, hoists, derricks, scrapers, yes, even cableways. You'll find alphabetical listings of each machine with recommendations of the correct wire rope for the longest wear . . . and lowest service cost.

These recommendations are based on long experience of contractors who used LAY-SET Preformed "Green Strand" Wire Rope all over the country. They worked on dams, excavations, strip mines, road building, and the many other jobs general contractors do day in and day out.

Get a copy of HAZARD "Wire Rope Recommendations for General Contractors" from your local HAZARD distributor, or write our Wilkes-Barre office. Ask for Booklet 129-B. And—when you need wire rope, ask for and *get* HAZARD LAY-SET Preformed Green Strand Wire Rope.

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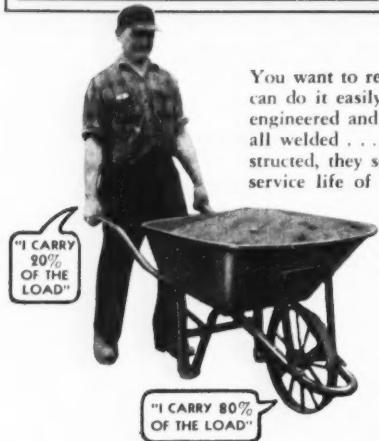
HAZARD WIRE ROPE DIVISION
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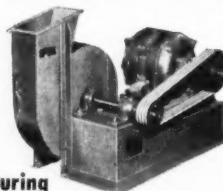
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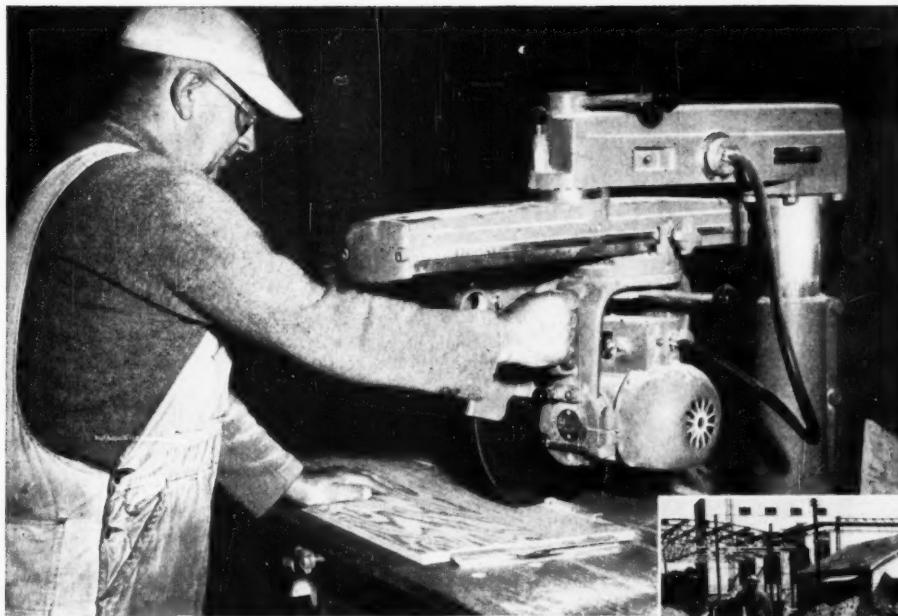


NEW PAINT STOPS FIRE—The building industry is watching with keen interest the recent development of Fyr-Kote fire retardant paint which has recently been perfected for all types of dry wall construction cellulose board and other interior surfaces. The paint is claimed to contain a mass of tiny built-in fire extinguishers, which when exposed to flame pour out carbon dioxide and calcium chloride, which smothers fire and retards the spread of flame on the surface. The new paint carries the Underwriters' label.—**Fyre-Kote, Morris Paint & Varnish Co., 27th & Douglas, Omaha, Neb.**



PRIME-MOVER SNOW PLOW—An improved blade unit for snow removal, featuring a spring-type counter balance for effortless raising and lowering of the snow blade, has been introduced as an attachment for the Model 15 Prime-Mover. While the blade unit is in use, the Prime-Mover may be equipped with either the 10-cu ft hopper or with flatbed for use in carrying ballast for added traction or for hauling sand, salt or cinders for sprinkling on icy sidewalks and driveways. The blade, measuring 50 in. in width, can be set at an angle to either side. Quick interchangeability of the bucket, platforms and blade attachment, as well as a sprayer attachment for weed control in season, gives the Prime-Mover year-round versatility in bulk handling and maintenance.—**The Prime-Mover Co., Muscatine, Iowa**

NEW COATING SEALS AND WATERPROOF—A permanent transparent coating which can be used as both primer and finish coat to seal and waterproof concrete, mortar, brick, steel and wood is called the Delrac Coating. On concrete, this product prevents powdering, dusting and fluorescence. It seals the pores of wood and prevents moisture penetration and fungus attack. It also is said to be an efficient rust preventive for steel and iron and possesses excellent adhesion characteristics. The coating can be sprayed, brushed or dipped. When sprayed on freshly poured concrete, it is claimed the coating is an excellent curing agent, eliminating the use of covering and wetting concrete during the curing operation.—**Delrac Corp., Watertown, N. Y.**



Cutting plywood on the same DELTA Radial Saw that cuts all wood on the job site.



Workmen place concrete forms for the \$5 million tube mill built by the H. K. Ferguson Company. All forming on the job was cut with a DELTA Radial Saw.

"DELTA'S Ease of Handling Steps Up Production"

that's what H. K. Ferguson Co. says about the DELTA Radial Saw

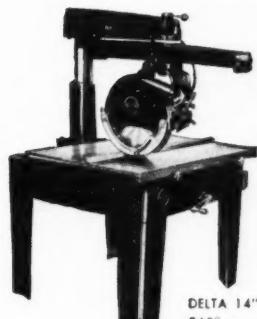
Eight hours a day, seven days a week, a DELTA 14" Radial Saw constantly rough and bevel cuts plywood, pine, birch, and oak at Bridgeport Brass Company's new \$5 million tube mill being constructed by the H. K. Ferguson Company. "Real production increases developed immediately," reported James Thompson, veteran carpenter . . .

"I've handled every radial saw on the market in my 49 years as a carpenter, and DELTA is the easiest machine I've ever used. We used to think radial saws were clumsy and awkward to operate, but there's nothing awkward about a DELTA. DELTA's ease of handling means

stepped up production. The simple adjustments enable us to move quickly from one cutting operation to another. And, the controls are right there in front of you; you don't have to go looking for hidden cranks and guides.

"A DELTA will really take punishment, too," says Mr. Thompson. "You don't baby a saw on a construction job like this, and we've had no maintenance . . . no trouble at all."

Find out now how DELTA Radial Saws can help you cut costs on any construction job. Send the coupon today for full information and the name of your nearest DELTA Dealer.



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MILWAUKEE
DELTA QUALITY MAKES
THE DIFFERENCE

DELTA QUALITY POWER TOOLS
Another Product of **Rockwell**



DELTA 14" Radial Saw with exclusive
360° arm swing lets you make every cut
above the work table...quickly...safely.

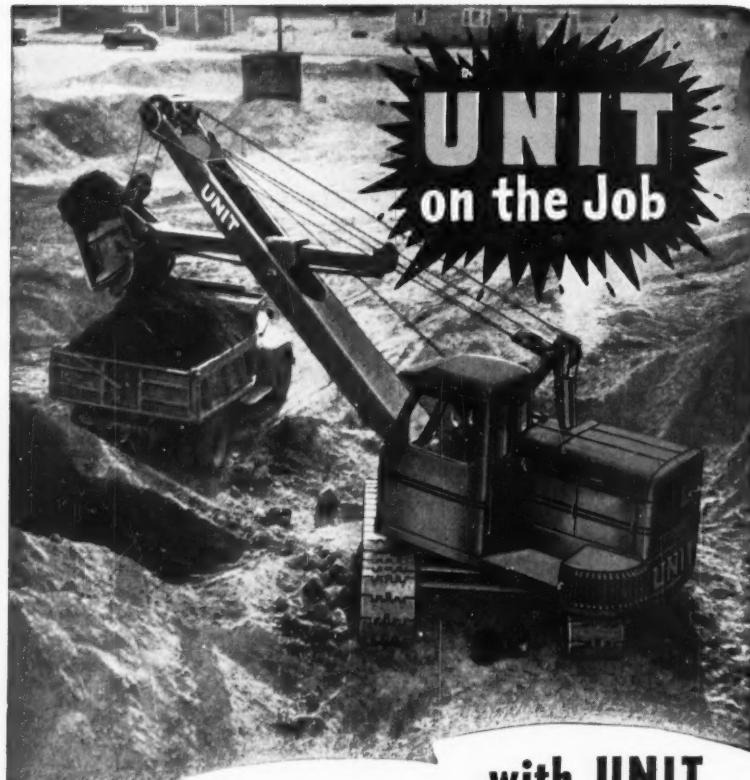
Delta Power Tool Division
ROCKWELL MANUFACTURING COMPANY
658M N. Lexington Ave., Pittsburgh 8, Pa.

Please send Delta Radial Saw catalog.
 Please send name of nearest Delta Dealer.

Name _____

Address _____

City _____ Zone _____ State _____

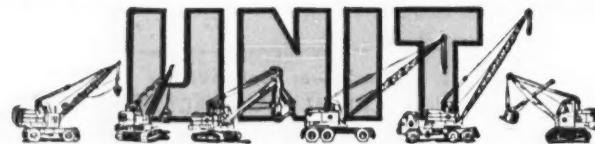


UNIT on the Job

with UNIT Truck Loads Step-up

Here's a UNIT $\frac{3}{4}$ yard Shovel that's "in there swinging" . . . making big payloads. UNIT'S balanced stability and power permit hard digging . . . produce maximum yardage at low operating cost. Fewer working parts cut down replacements required . . . reduce maintenance costs. The FULL VISION CAB enables operator to see in ALL directions . . . promotes safety . . . increases efficiency. Results in more loads per day and easier load handling. Get the complete UNIT story. Write for literature.

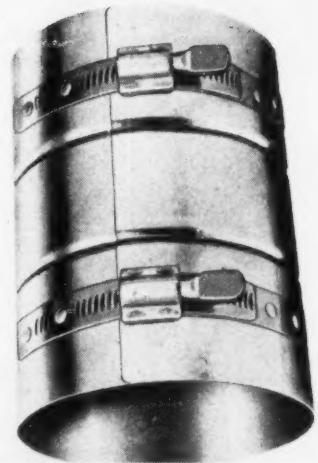
UNIT CRANE & SHOVEL CORPORATION
6305 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U.S.A.



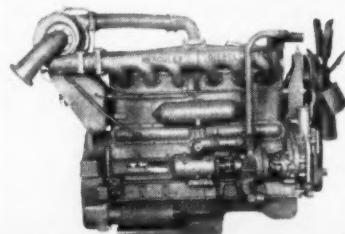
**1/2 or 3/4 YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS... GASOLINE OR DIESEL**



All Models Convertible to ALL Attachments!



NEW PIPE CONNECTOR—A new aluminum or galvanized pipe for ventilating use is fastened rigidly to pipe or fittings by a new connector without crimps or tools. Called the Jenkins Speed-Lok pipe, it is shipped in 5-ft lengths requiring very little storage space. It is not necessary to hammer the seams. When the pipe is closed with the hands, each tab located every 6 in. along the male seam slides through a corresponding slot in the female seam. The tabs are bent over with finger pressure, locking the pipe in a rigid, positive lock which will not break, even if cut after assembling. The Jenkins pipe is not crimped at the joints, but is connected by the new Jenkins Tite Aire pipe connector. The elimination of crimps, it is claimed, results in a more efficient, quieter air flow. It is available in 4- to 100-in. sizes and in lengths of 5 ft.—Ralph Mfg. Co., Inc., Wadsworth, Ohio

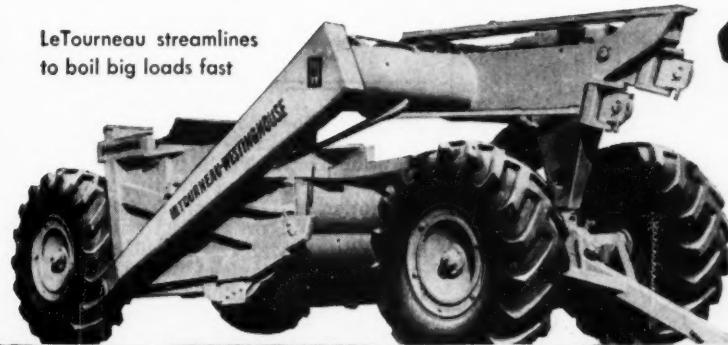


TURBO-SUPERCHARGED ENGINE

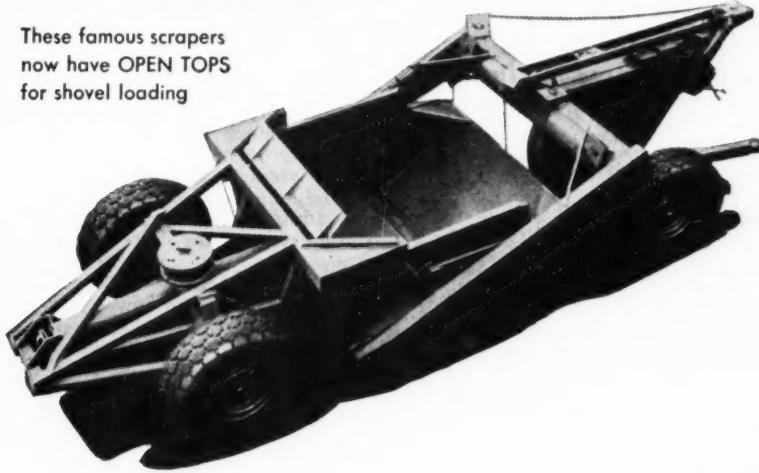
—Hercules is now producing a turbo-supercharged version of their 6-cylinder diesel engine Model DFXE. Designated the DFXE-TS, the new engines has a 5 $\frac{5}{8}$ -in bore, a 6-in. stroke and 895-cu in. piston displacement. It develops 846 lb-ft torque at 1,800 rpm and 318 hp at 2,000 rpm. This super-charged version fulfills the demand for more horsepower without increasing the fan-to-flywheel length. The new engine, according to the builders, is particularly suited to power construction equipment, oil field machinery and mining equipment.—Hercules Motors Corp., Canton, Ohio

Save up to 25%.

LeTourneau streamlines
to boil big loads fast



These famous scrapers
now have OPEN TOPS
for shovel loading



—Why pay more when you can buy
the best scraper on the market at savings from 9% to 25%?

You have used them . . . you have watched them on practically every scraper job you've ever seen! Over 35,000 scrapers all over the world prove LeTourneau-Westinghouse as "top quality".

This famous, world's most popular, LeTourneau-Westinghouse Carryall Scraper costs less to buy, less to maintain . . . loads faster, boils better, heaps a bigger load. Why pay more for less?

Available in a complete range of sizes from 10½ to 28½ yards heaped for use with both track-type tractors and electric-control Tournatractor. Don't buy any scraper (or other tractor equipment) till you've checked our prices!

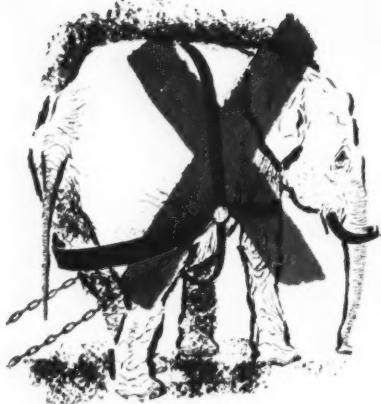
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behind these scrapers than
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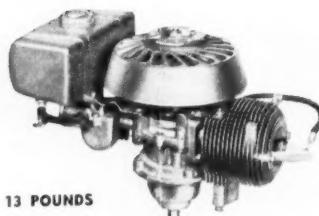
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PEORIA, ILLINOIS



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go Lightweight**



13 POUNDS

The POWER PRODUCTS Lightweight packs
more power per pound

When it comes to lightweight power nothing can touch this engine. Not only is it amazingly lightweight, but it has every important quality feature to assure long, dependable performance



For portable equipment, you can't find a better engine for lightweight and dependability.

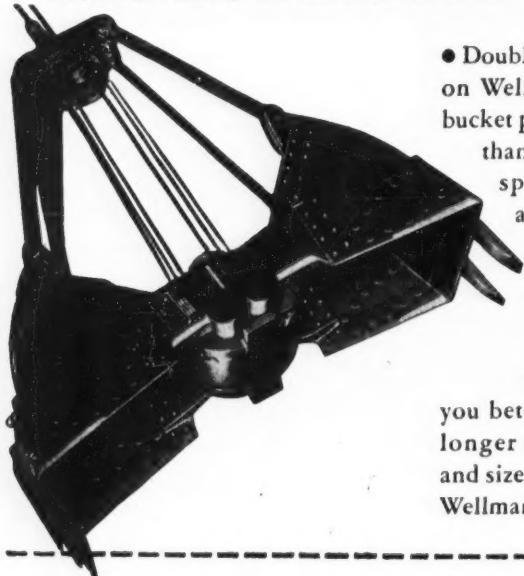
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go Lightweight**

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FAST BUCKET OPENING SPEEDS OPERATIONS



• Double-hinge construction on Wellman's multiple-rope bucket permits faster opening than a single hinge. This speeds up operations, also gives a bigger spread in the open bucket for the same headroom.

Wellman's welded-design buckets offer you better performance and longer service. In all types and sizes you'll do better with Wellman!

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New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

CRANES—The Thew Shovel Co. has two recent releases—one describing the 6-ton Lorain TL-10 truck crane and the other devoted entirely to the application of Lorain cranes to the tilt-up method of precast concrete slab construction. The TL-10 truck crane is the newest addition to the Lorain line and retains all of the turntable features of the TL series, such as packaged components anti-friction bearings, fast, sensitive clutch action, etc. They have reduced the weight and have modified it so that it can be used on commercial truck chassis. — **Thew Shovel Co., Lorain, Ohio.**

ELECTRIC GENERATING PLANTS—A Blue Book of general information, pocket-sized edition, giving data on the selection of engine-driven electric generating plants has just been released. The book covers alternating current, direct current, and battery charging. Cost of operation and installation on each type of gasoline, diesel and gas engine are discussed. Copies of this Blue Book may be obtained from **D. W. Onan & Sons, Inc., Minneapolis, Minn.**

CRANE-DRIVE EQUIPMENT—A 12-p bulletin on dc crane-drive equipment featuring cutaway and exploded views of dc crane motors and control may be obtained by addressing **General Electric Co., Schenectady 5, N. Y.**

DRAINAGE STRUCTURES—The title of a new 4-p bulletin released by Armeo Drainage & Metal Products, Inc., is "Bury Your Bridges to Make Them Better." The folder points out how corrugated metal structures can cut maintenance cost, are quickly installed, and have adequate strength. Copies of this Armeo bulletin may be had from the **Armeo Drainage & Metal Products Co., Middletown, Ohio.**

BITUMINOUS PLANT—Barber-Greene has just released a two-color, 16-p folder illustrating a wide variety of cold feed methods for bituminous mixing plants. The booklet makes sound engineering recommendations on the scope and advantages of many types of feed systems which will be of assistance to operators of all types of mixing plant equipment. Copies of this interesting booklet are available without charge from **Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.**

New Sinclair Grease for Heavy Duty Equipment

Tests prove New Grease
.... and Longer

gives Better Lubrication
Life to Bearings!

A new Sinclair grease with superior lubricating qualities is now available for bearings of heavy duty construction equipment. Sinclair HEAVY DUTY BEARING GREASE is specially compounded to *stay put* in heavily loaded, slow speed rotating or sliding bearings.

New Sinclair HEAVY DUTY BEARING GREASE has an exceptionally high load-carrying capacity . . . greater resistance to pounding and shock loads . . . greater resistance to melting out. Operators of power shovels, draglines, conveyors and all other heavy duty equipment are assured of longer bearing life . . . higher productivity . . . lower operating costs.

Sinclair HEAVY DUTY BEARING GREASE is available in three grades — "0," "1," and "2." It is easily applied with a hand gun or air gun. It comes in 35 pound pails and 100 and 400 pound drums.

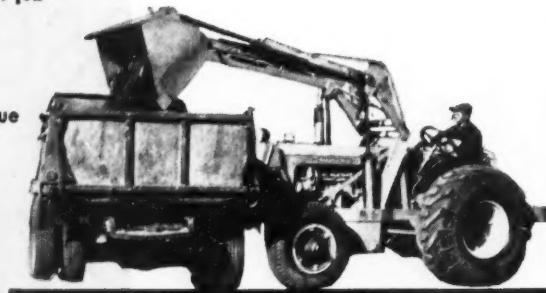
A Sinclair Lubrication Engineer can give you expert counsel on how you can get the most out of Sinclair's new HEAVY DUTY BEARING GREASE. Phone your local Sinclair Representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.



SINCLAIR HEAVY DUTY BEARING GREASE

MM WHEELERS

- Equipped for your job
- easy to handle
- high speed
- large capacity
- high engine torque at low rpm
- durable single unit construction
- low in cost
- nearby parts and service



Up and out, with power to spare! Heavy-duty MM Wheelers offer the important advantages of proved conventional design.

Rugged MM WHEELERS

Built and equipped for your heavy jobs!

CONVENTIONAL DESIGN FOR FRONT OR REAR END ATTACHMENTS

You get *more work* out of MM Wheelers with this conventional design that handles a *bigger* variety of attaching equipment. Front and rear mounted equipment makes *both* ends of your Wheeler pay. Practical drawbar applications further reduce machinery investments. MM design combines economy of first cost; fast, easy operation; ability to handle *more* tool types, and real operating safety.

Let your MM distributor demonstrate. See for yourself why MM owners call their Wheeler and equipment combination the "one man contractors."



MORE WORK from more equipment! MM Wheeler owners get all the advantages of design that make both ends pay — like this 3 yd. scraper.

Provisions for rear mounting give you real backhoe performance. Again, Wheeler design pays off with more work from standard design.



MINNEAPOLIS-MOLINE
MINNEAPOLIS 1, MINNESOTA

CATERPILLAR LITERATURE — Caterpillar Tractor Co. is offering 7 brand new pieces of literature describing its products and showing various applications: No. 6 Shovel—This book called "Shovels at Work" pictures a variety of earthmoving and industrial operations. Ask for Form 30791; D-6 Tractor—This booklet highlights the new oil-type clutch and lists cutaways and specifications on the D-6 tractor. Ask for Form 30825; D-6 Tractor—A 32-p publication giving the complete story on this model tractor. Ask for Form 30379; Pipe Layers — 8-p booklet showing the Caterpillar Pipe Layer working in many applications. Form D377; D-8 Pusher—This broadside describes different applications of the D-8 tractor to push load in tandem by using a C-frame and push block. Request Form 30903; Power Parade—This publication covers a long list of applications for Caterpillar diesel engines ranging from 57 to 500 hp. Form 30757; Scrapers—"A Good Business Deal" is the title of this 8-p booklet devoted to scrapers and their applications. This one is Form 30772. All of this literature can be obtained from any Caterpillar dealer or by writing direct to Caterpillar Tractor Co., Peoria, Ill.

HARDFACING — Air Reduction is offering a 12-p reprint of an article that originally appeared under the heading of "Selection and Evaluation of Methods of Hardfacing." The major methods used in the application of hardfacing materials are discussed in this reprint, with special emphasis on the inert-gas-shielded arc process. You can obtain a copy by writing to the Air Reduction Sales Co., 60 E. 42nd St., New York, N. Y.

V-BELT DRIVES—This 52-p technical manual covering all elements of V-belt drives, using tables, graphs, and diagrams should be of assistance to maintenance supervisors, mechanics, purchasing agents and students, as well as to engineers. Copies are free and will be sent to you by the Boston Woven Hose & Rubber Co., P. O. Box 1071, Boston 3, Mass.

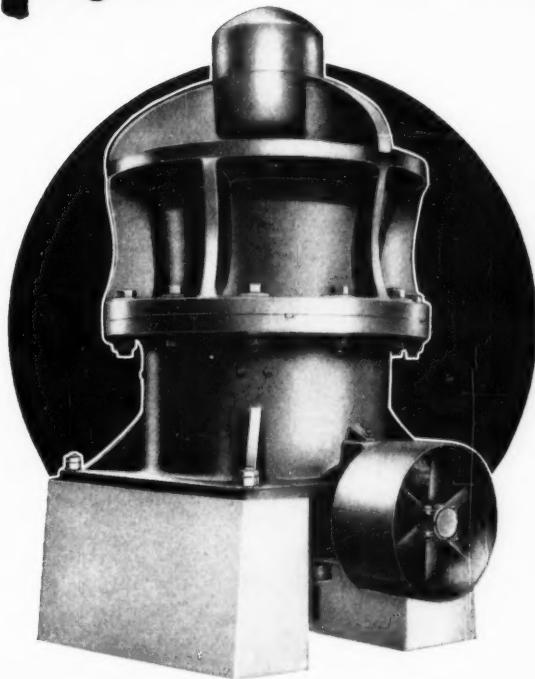
ROLL CRUSHERS—A 12-p booklet describing the Lippmann line of roll crushers is available to interested persons needing crushing equipment. Copies of this bulletin, Form 1120, are available from the Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee 14, Wis.

RADIO COMMUNICATION EQUIPMENT — General Electric Commercial Equipment Department has just issued ten new bulletins which cover latest improvements in radio communication equipment for industrial application. May be obtained from the Inquiry Section, General Electric Electronics Div., Electronics Park, Syracuse, N. Y.

more efficient
stone production



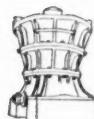
Means More Profits



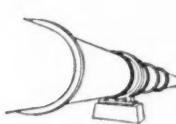
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806 TRAYLOR TY
crusher operators
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The compact design, non-chokable bell head and curved concaves of a Traylor TY Crusher assure maximum operating efficiency for producing aggregate on the job. Higher output at lower horsepower per ton is a big Traylor feature which adds greatly to your profit picture. Less down-time for maintenance, greater hourly production, *plus a more uniform aggregate* are proven advantages of a Traylor TY . . . all thoroughly explained in a big fact-packed bulletin. Mail coupon for your free copy now.

Traylor TY REDUCTION CRUSHERS



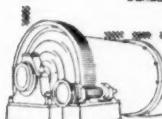
Primary Gyratory Crushers



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1537 MILL ST., ALLENTOWN, PA.

Send me your Bulletin 7112 on Traylor TY Reduction Crushers.

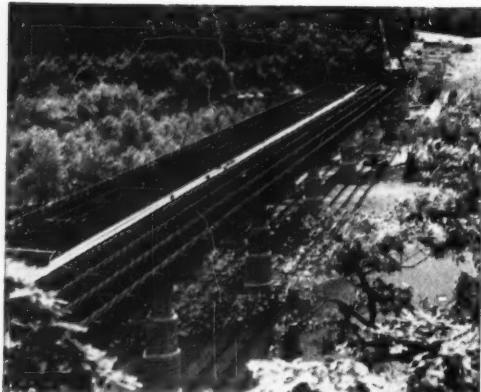
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Sales Offices: New York • Chicago • San Francisco
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Superstructure of bridge crossing the river at Delaware Water Gap. Below: Bridge across the Delaware between Milford, Pa., and Montague, N. J.

Three New Bridges Span the Delaware

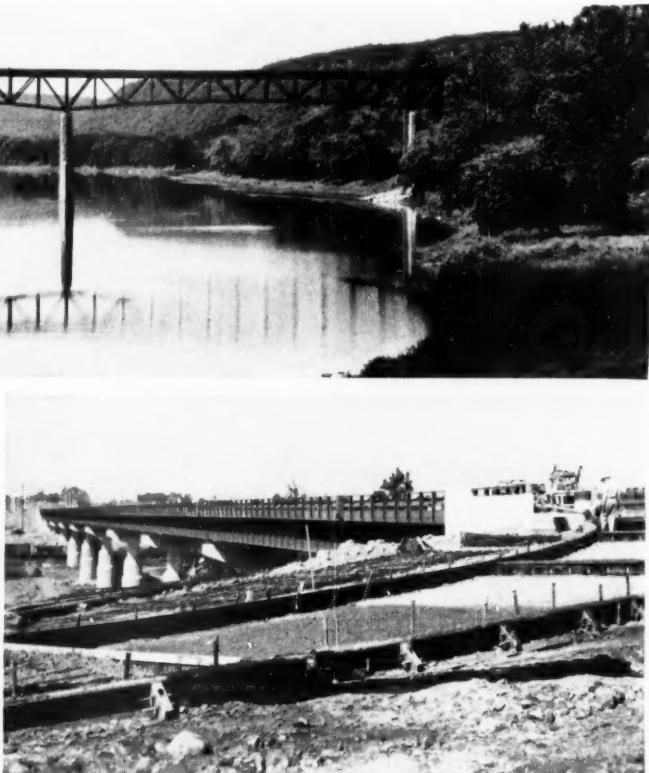
To provide greatly increased facilities for crossing the upper Delaware River in the general area of the Delaware Water Gap, three new bridges together with elaborate approaches have been built for the Delaware River Joint Toll Bridge Commission. Steel for the bridges and the approaches, shown under construction, was supplied by Bethlehem, and included piling, fabricated steel, reinforcing bars, dowel units and bar mats.



Bethlehem Reinforcing Bars come to the job site at Portland-Columbia bridge, ready for immediate placing.

Right: Paving one approach to bridge across Delaware river connecting Portland, Pa., and Columbia, N. J.

Below: Bethlehem Dowel Units being installed in the Pennsylvania approach to the Delaware Water Gap bridge. Contractor: George M. Brewster & Sons, Inc.



J. E. Greiner Co. were the engineers, and Johnson, Drake and Piper, Inc., the general contractors, for the substructure of the three bridges.

Paving contractors for the approaches were A. L. Bake and Son and G. H. Litts (for the Milford, Pa.-Montague, N. J. bridge), George M. Brewster & Sons, Inc. (for the Pennsylvania approach to the Delaware Water Gap bridge), and S. J. Groves and Sons Co. (for the Pennsylvania and New Jersey approaches to the Portland-Columbia bridge, and the New Jersey approach to the Delaware Water Gap bridge).

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Bethlehem Products for Bridges and Highways include:
DOWEL UNITS • REINFORCING BARS • BAR MATS • GUARD RAIL • GUARD RAIL POSTS • WIRE ROPE AND STRAND PIPE • HOLLOW DRILL STEEL • SPIKES • BOLTS AND NUTS • TIMBER BRIDGE HARDWARE • TIE RODS • SHEET- AND H-PILING • FABRICATED STRUCTURAL STEEL



What the readers think of

"One United Construction Union"

MANY INTERESTING and pertinent comments have been received by the editor regarding the two editorials published in the August and September issues advocating "One United Construction Union." Following are excerpts from some of the letters and comments:

Startling Thought . . .

That labor itself would do well to wipe out craft unionism in the construction industry is quite a startling thought. The argument that everybody concerned would do better with one big "vertical" construction union loses its first blush of radicalness when you find it put forth in a management publication.

A condensation of this unusual article, by the editor of CONSTRUCTION METHODS AND EQUIPMENT magazine, appears in this section of The Sunday Journal. However the subject may touch you—as builder, worker or only as a possible buyer or builder of a new home some day—you'll find it gives quite a broadening fillip to your thinking.

The author's thesis is that the present "chaos"—a score of craft unions each with a high wall around it, the hundreds of locals and thousands of contracts, the competition in contract terms, the endless quibbles over jurisdiction—is a weakness in labor itself and heavy drag on the nation's biggest industry.

He envisions one construction union with just three pay brackets—unskilled, semi-skilled and skilled. He believes the benefits would include greater employment stability, over-all pension and welfare protection, more attractive careers as "construction men, not prima donnas," more efficient and less costly construction and therefore more of it, an open door for adoption of new materials, processes and techniques.

More than just envisioning this, he predicts it as inevitable because the existing labor system "is rapidly becoming archaic. Craft unionism is doomed to extinction if it follows present practice."

In view of the long traditions of strict craft separation, and the entrenched interests of craft union

hierarchies—plus some employers' instinctive fear of "one big union"—all this may seem like pretty dreamy stuff. But dreams are the stuff of which progress is made. At least they can jar one's thinking out of old grooves.—Editorial Published in the Milwaukee Journal Sept. 13, 1953.

The Only Answer . . .

Your editorial in the August issue is certainly tops. I have read many articles on labor, but none has had the right answer as yours does. Your suggestions are good, and I honestly believe the only answer to a successful contracting business in the future . . . —Frank W. Barnes, Labor Consultant, Merritt-Chapman & Scott Corp., New York, N. Y.

Quite a Bunch of Words . . .

"One United Construction Union," is quite a bunch of words. I am looking forward to the opportunity, the next time we happen to be to-

(Continued on next page)

The manufacturers of Waterplug, Thoroseal, Quickseal

Introduce 3 NEW PRODUCTS



RED STAR THOROLOK

Intended for asbestos shingles, on roof or exterior walls of your home or other building. THOROLOK is prepared in six beautiful pastel colors. Ask for Color Card 32-C.



BLUE STAR THOROLOK

Prepared especially for basement floors which need protection and corrects unsightly appearance. Furnished in six beautiful colors. Ask for Color Card 32-C.



INVISIBLE THOROCLEAR

Clear, water-repellent material for porous brick, stone, concrete, stucco, asbestos siding and shingles, interior plaster and masonry surfaces, where texture and color are to be retained.

NEW PROTECTION

With addition of three newly-tested products to The THORO System, any type surface such as steel, wood, asbestos siding and shingles and every type masonry and stucco can be protected from excessive weathering, caused by rain and changing temperatures.

Standard Dry Wall Products

NEW EAGLE, PENNSYLVANIA

"HOW TO DO IT"
Write for our
pictorially de-
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**...For PEAK PERFORMANCE
On Every Job
CARVER PUMPS**

If you want peak performance on every dewatering job depend on CARVER!

CARVER manufactures the complete line of self-priming pumps from 4000 G.P.H. to 250,000 G.P.H. Every one of these pumps has the same simple design, sturdy construction and rugged durability that mean outstanding performance where jobs are really tough.

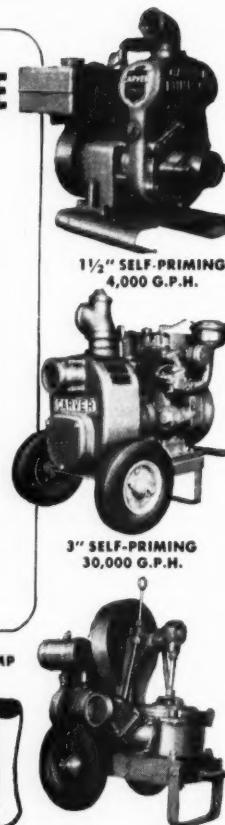
Your CARVER DISTRIBUTOR can also supply you with Diaphragm Pumps and a full line of high pressure Jetting Pumps. See him today.

**CARVER PUMP CO. 1402 Hershey Ave.
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CARVER
the quality name in pumps

**4" DIAPHRAGM PUMP
6,000 G.P.H.**



Fast, Low Cost Controlled Concrete Curing With

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Servicised Concrete Curing Compounds are made in our own plant under rigid laboratory control and are guaranteed by us to be uniform in quality and results. There is a Servicised Curing Compound for every requirement. Write for the new Servicised Concrete Curing Compound circular which describes the complete line.



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ONE UNION . . . Continued

gether, to kick this around a bit with you. I have a lot of questions and need a lot of answers. I am probably one hundred years wrong; sorry I won't be around to determine the situation that many years hence. I have been trying to sell myself on your idea, but don't get very far, mainly because of the imponderables connected with the building trades labor end of the idea. Anyway . . . I will be willing to listen.—W. W. Moeller, Executive Secretary, Master Builders of Iowa, Des Moines

One Union Card . . .

I must applaud your reasoning. I have long preached one union card for all working men of the Construction Industry. You have given me some new ammunition to shoot at my bird-brained audiences.—O. O. Martin, Anchorage, Alaska.

All for One Union . . .

I'm all for your proposal of one union for construction. I run a small welding shop catering to special and difficult welding operations in the construction field. Yet I'm seriously handicapped because my small crew cannot possibly join the union of every major building trade that occasionally needs our services. Pipe fitters, and steel workers and other trades object to us doing jobs they are unable to do themselves because we don't carry their card.—Martin Friedman, So. Norfolk, Va.

**What You Propose
Is Greatly Needed . . .**

Having started your career in heavy engineering construction, the theme of your proposal is very probably resurrected from your memory of Labor peace and speedy production accomplished with that type of construction and that practical Labor set-up. In those days a good construction man could do anything, was proud of it and never wasted his valuable effort and time with the belittling and quarrelsome task of determining who did what.

What you propose is today greatly needed in certain elements of the industry, such as development of flood control and navigation systems on our inland rivers; the building of power and chemical plants by those contractors serving clients of National scope; the building of the great turnpike and thru highway systems now just commencing; the placing of pipelines across the Nation; and many types of specialized tasks requiring, for safe and successful operation, a group of workers trained to know, and have confidence one in another.—G. W. Maxon, President, Maxon Construction Co., Dayton, Ohio

Will this happen to your next bid?



Whether or not you beat competition on a bid could depend on your bond rate. If you're ready with a *low, preferred* bond rate, you'll have an important advantage at your next letting.

To prepare for future bids, talk to your Indemnity Agent. Ask him to establish your credit line with Indemnity Insurance Company of North America, the largest independent, offering lowest bond rates* to contractors of *skill, integrity and responsibility*.

When you have established your qualified credit line, no one will be able to outbid you on this important item. You save money at Indemnity's low rates, too — and you are assured of getting bonds on future jobs without delay.

See your Indemnity Agent now. It may make the difference between rejection and acceptance on your next bid.

Look to the future . . . establish your credit line now!

*Indemnity's low rates are not available in Louisiana and Texas.



**INDEMNITY INSURANCE COMPANY OF
NORTH AMERICA**

One of the North America Companies, which are headed by Insurance Company of North America, founded 1792

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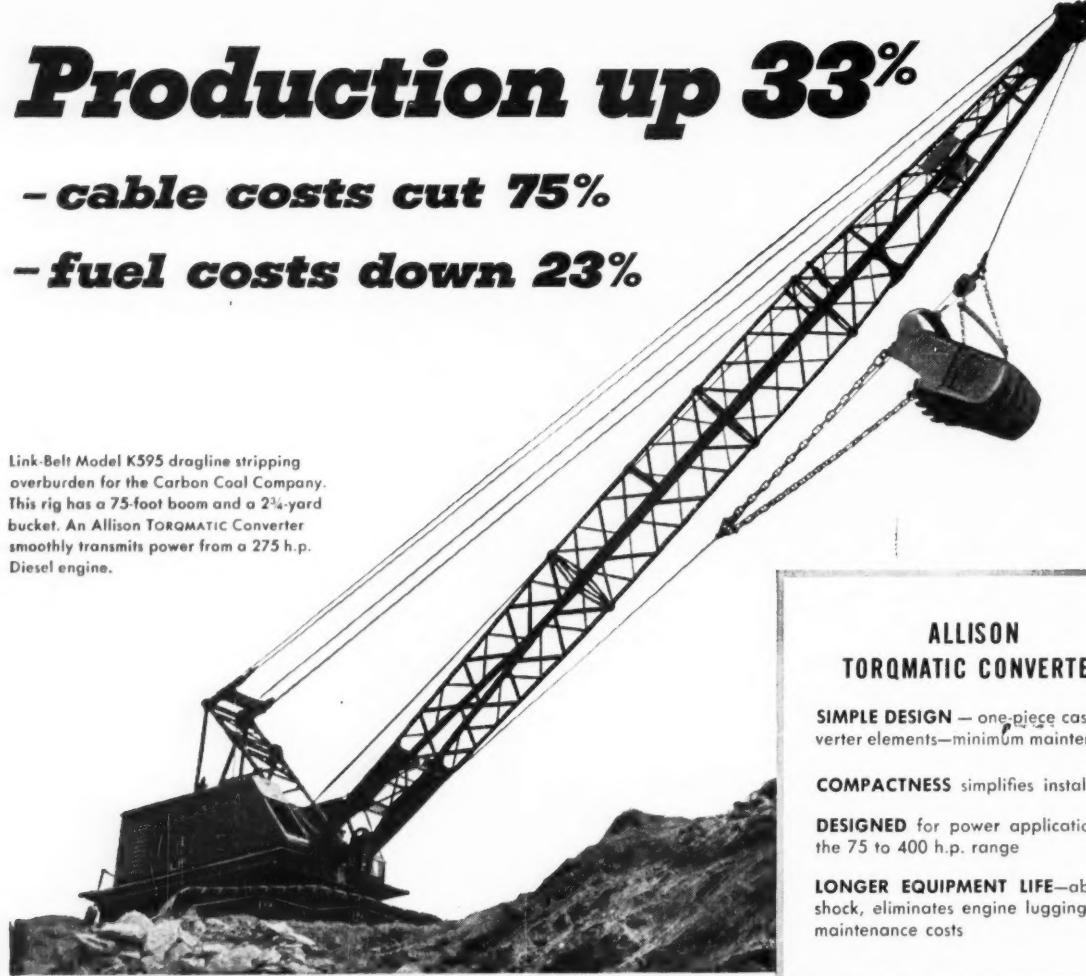
Philadelphia 1, Pa.

Pioneers in Protection—Serving with 20,000 Agents in the Public Interest

Production up 33%

- cable costs cut 75%
- fuel costs down 23%

Link-Belt Model K595 dragline stripping overburden for the Carbon Coal Company. This rig has a 75-foot boom and a 2 1/4-yard bucket. An Allison TORQMATIC Converter smoothly transmits power from a 275 h.p. Diesel engine.



Here's another operator who's boosting production and cutting costs with Allison TORQMATIC DRIVES: The Carbon Coal Company operates two Link-Belt draglines, strip-mining coal near Grove City, Pa. The units are nearly identical—one has an Allison TORQMATIC Converter, the other is direct-driven—but there's a big difference in operating costs and production.

The Allison Converter absorbs shock loads so dragline cable on the

TORQMATIC-equipped unit lasts four times as long, *saving \$2160 a year on cable alone*, a reduction of 75%. The TORQMATIC-equipped unit strips a 60x40x25 foot "lift" of overburden in 24 hours against 32 hours for the direct-driven unit, a 33% increase in production. A comparison of daily fuel records shows the friction drive unit consumes 130 gallons while the Converter-equipped unit uses only 100 gallons, a cut in fuel costs of 23%.

ALLISON TORQMATIC CONVERTER

SIMPLE DESIGN — one-piece cast converter elements—minimum maintenance

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DESIGNED for power applications in the 75 to 400 h.p. range

LONGER EQUIPMENT LIFE—absorbs shock, eliminates engine lugging, cuts maintenance costs

The TORQMATIC-equipped unit has rolled up such an impressive performance record that this operator intends to specify TORQMATIC DRIVES in all his new heavy-duty equipment. You, too, can cut your costs by specifying Allison TORQMATIC DRIVES the next time you buy. Ask your equipment dealer, manufacturer or write:

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COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES * TRUCKS * TRACTORS * SCRAPERS * SHOVELS * DRILLING RIGS

BETTER RELATIONS . . .

Continued from page 140

contain provisions to cover many featherbedding practices. Contractors during negotiations for a new contract could submit counter proposals to eliminate such provisions from the contract. The time will come—if not this year maybe next—when the union negotiating will consider something else more important and will give up the one to obtain the other. Thus, the problem may be eliminated through collective bargaining.

On the other side of the picture, building trades officials claim with considerable merit that there are many contractors who attempt to overload a man with work, expect him to do too much. The unions have to watch that and in so doing try to set up in collective agreements stipulations to cover the practice. "Some contractors expect a man to operate a crane, bulldozer, or some other piece of equipment and cover three compressors at the same time. We say it can't and shouldn't be done," says one union



MANY CONTRACTORS OVERLOAD a man, rightly claim the building trades. Unions try to set up agreements to cover the practice.

official. "He can operate the equipment but not cover the compressors—someone else should do that."

Union officers also point out that contractors on certain types of contracts (cost-plus-fixed-fee, time and material, etc.) overload their jobs without any help from the unions. Their attitude seems to be to get the job done regardless of the number of men employed. As the unions contend, it's not a one-sided proposition—if unions are guilty of featherbedding, so are contractors.

According to Dick Gray, one of the most serious problems facing the industry—for management and

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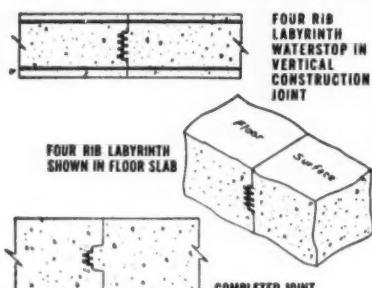
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BETTER RELATIONS... Continued

labor—is very bad public relations. People generally know little of the problems confronting the industry and read in the press only what is newsworthy, which is usually bad. A man is killed on a construction job; a union business agent embezzles union funds or "guarantees no labor problems on the job," a contractor installs defective materials. These make news.

The excellent safety record of many contractors and care taken by men on dangerous work, the thousands of honest business agents and reputable contractors—they don't hit the headlines. The result: The public considers the construction industry as a whole a pretty unsavory business.

In Gray's opinion both the unions and contractors should take steps to present the true picture of the industry to the public. To organize a program, it will be necessary for top officials of the building trades unions and officers of national associations of contractors to set up a joint committee. Once a sound public relations program is worked out it can be transmitted to the associations' chapters and local unions to be developed on a local area basis.

**Be Cautious
With Hand Tools**

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1. Use the proper tool for the job.
2. Be sure it's in good condition.
3. Use it correctly.
4. Put tools in tool box or shed at the end of each shift. Don't take someone else's word that the tool is in good shape.

Look it over yourself! Is it in good shape? Is the handle free of splinters? Is the chisel burred? Is the saw sharp? What about the wrenches with jaws that are battered up? Get rid of them. Don't try to use a file or screw driver as a pry or chisel.

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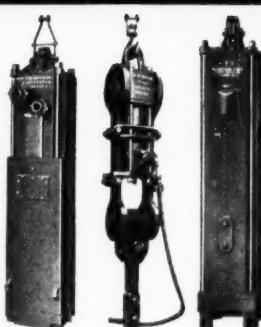
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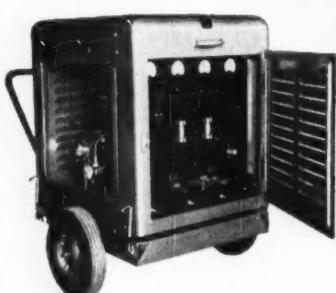
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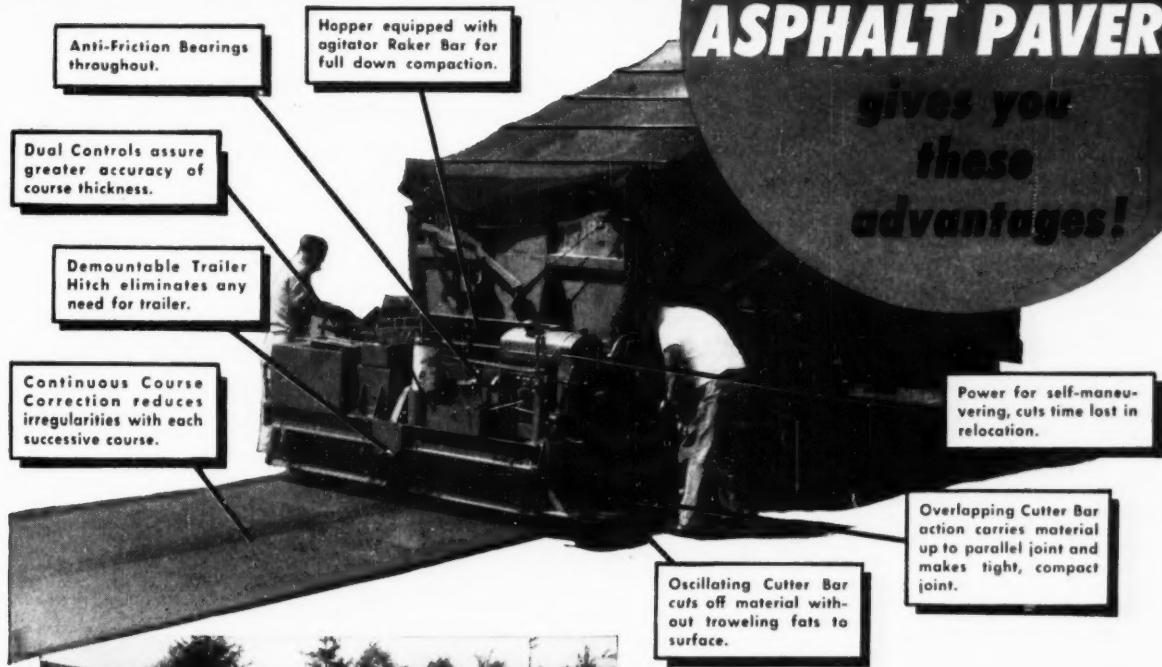
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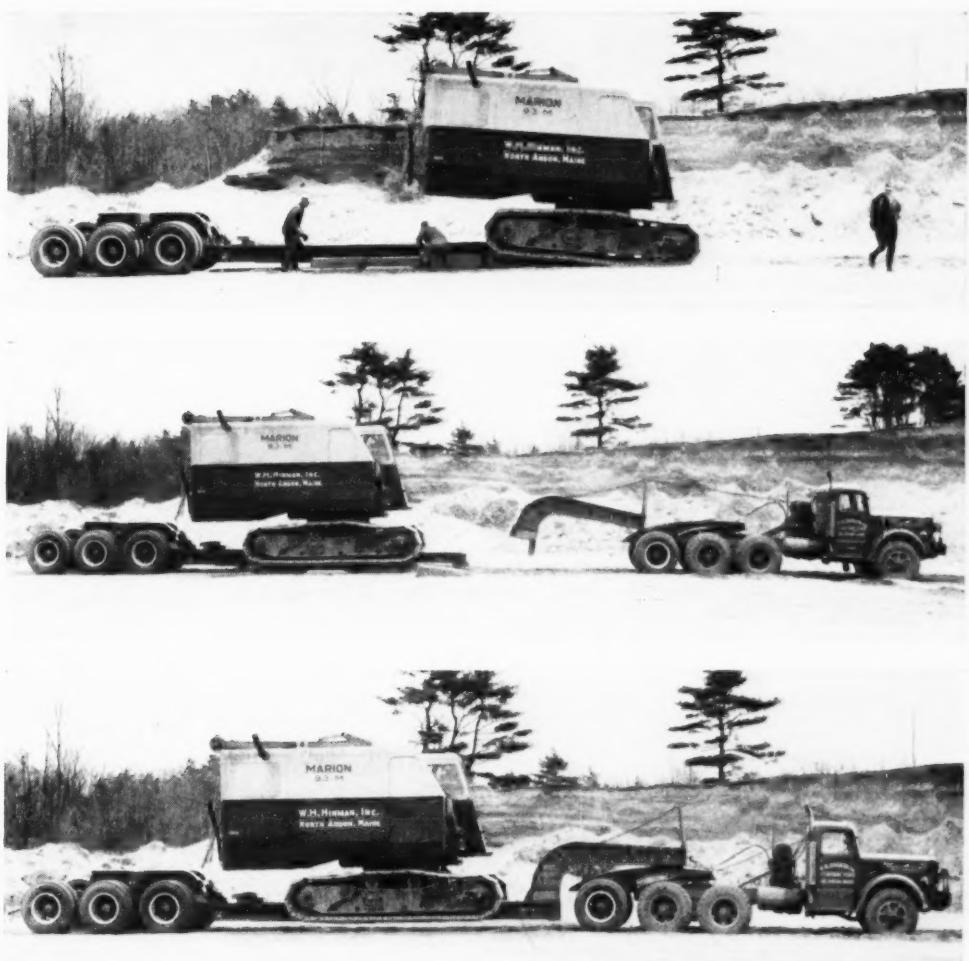
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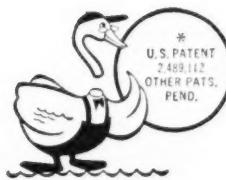
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Shown here is a Talbert Beam Deck Trailer, Model T3BD-75-RG-RA with a Talbert Single Axle Dolly loading a Marion, Model 93M. This rig is owned by W. H. Hinman, Inc., of North Anson, Maine.

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...the **TALBERT** way



Talbert Trailers are designed so as to permit loads of this type to be hauled on the job. The empty weight has been held to a minimum, permitting the contractor to haul up to a yard and half machine legally in the State of Maine.

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City _____ State _____

Methods Memo . . .

MORE BUYING IN of allied lines becomes an accomplished fact with Allis-Chalmers Manufacturing Co. officially assuming operation of the Buda Co. and the Oliver Corp. acquiring the outstanding capital stock of Be-Ge Manufacturing Co.

Buda complements the A-C line of tractors and earthmoving equipment with 23 sizes of diesel engines and 20 sizes of natural gas, butane and gasoline engines, ranging from 5 to 516 hp; earth boring machines; and an extensive line of fork lift trucks and towing tractors for materials handling.

Be-Ge facilities (located in California) will give the Oliver Corp. a springboard for expanded West Coast operations. The Be-Ge line includes scrapers ranging in capacity from 1½ to 18 yd, hydraulic control units and cylinders, land-levelers, trenchers and an agricultural equipment line.

WELDED WIRE FABRIC inside bituminous road and airport resurfacing layers is a new paving technique with promise, according to the Wire Reinforcement Institute. The wire fabric serves a two-fold purpose; to control and minimize the rolling, "washboard" rippling and piling up of asphaltic concrete under heavy traffic; and to help prevent cracks in the original pavement from "reflecting" or striking through into the new topping.

CONSTRUCTION METHODS AND EQUIPMENT will have an article in the January 1954 issue describing by word and picture two applications where wire fabric was used. The Institute has a ten-minute motion picture in color on the process. Write for it at the National Press Building, Washington 4, D. C.

CONCRETE 2,000 YEARS OLD (well almost) and still in serviceable condition recently was recovered from an ancient submerged Roman wharf and brought to the U. S. for tests by Henry L. Kennedy, president of the American Concrete Institute.

Samples taken from piers that once supported a large wharf in the Bay of Pozzuoli, Italy, near Mt. Vesuvius are believed to be the oldest known example of hydraulic concrete, which is capable of setting up under water. The structure was built during the reign of Emperor Caius Caesar Caligula, 12-41 A.D., and the piers have been submerged since that time.

According to Italian technologists,

Roman engineers discovered that volcanic ash from Mt. Vesuvius reacted with lime to make a cement that would harden under water. Present tests are being run to determine resistance to weathering, freezing-thawing action and other deteriorating forces not a factor with submerged concrete in a warm climate.

AN EDITORIAL INDEX of articles appearing in CM&E during 1953 will be available to readers shortly after New Year. Single copies are available upon request and you can put in your request now before you forget to do so. Send it to: The Editor, CONSTRUCTION METHODS AND EQUIPMENT, 330 West 42nd St., New York 36, N. Y.

THIRTY ACRES OF ACOUSTICAL PLASTIC were machine-placed to sound-treat ceilings of the 14½-acre, three-story structure being completed to become the Army Finance Center at Fort Benjamin Harrison, Ind.

Vermiculite acoustical plastic, produced by the Zonolite Co., was mixed with water in plaster mixers on platforms located throughout the huge structure. Mixers dumped into Scoot-Crete machines which hauled the material to E-Z-On plaster-placing machines.

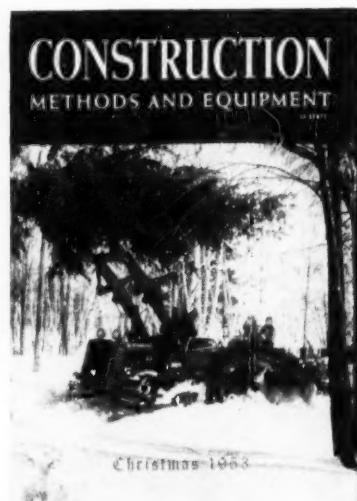
Approximately 90% of the ceiling surface receiving acoustical coating is concrete. The remainder is suspended metal lath covered with a scratch coat of gypsum-sand plaster.

A WORD OF THANKS is in order for all of you readers who have cooperated so splendidly in answering our readership surveys. Each month *Readex Reports* queries a representative group of **METHODS** subscribers to find out what articles and what advertisements are of most interest. From a study of your answers, editors and advertisers alike gain valuable insight into your reading habits and wants. And with these as a guide, we can continue to make **METHODS** ever more interesting and ever more valuable to you. So thanks again—keep up the good work.

PROGRESS PICTURES of construction jobs are taken regularly from the same approximate spot by some contractors on large projects. Depending upon topography, it may become necessary to erect a tower for the photographer to give him enough elevation for pictures of the site.

Jerry McLain, public relations director of the Del E. Webb Construction Co., now uses a high-lift fork truck to get the extra height needed. While photographing a project he stands on a pallet across the truck forks raised to their highest position.

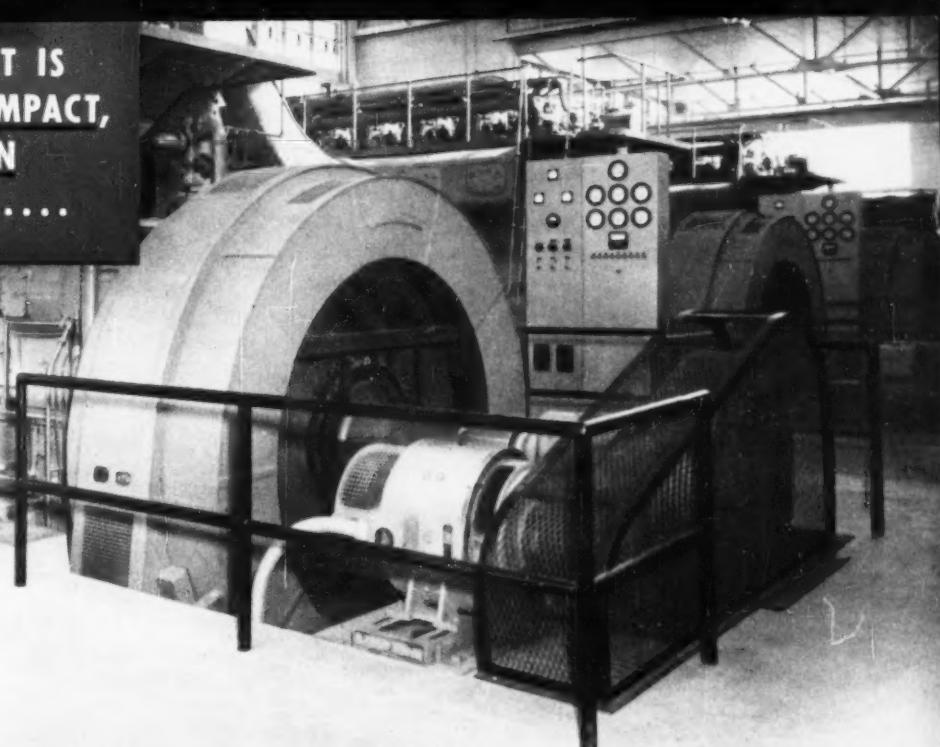
ELEVATORS ARE BEING INSTALLED before walls are erected at large building construction projects in Moscow so that building materials can be raised to upper stories without using scarce cranes. However, the official Russian government newspaper *Izvestia* says the supply of cranes is increasing, 500 tower cranes now being employed in the Moscow area alone!



On the Cover...

Bringing in the Yule Tree is an old custom throughout the Christian World—a ritual as ancient as Christmas festivities themselves. But naturally, up at the Drott proving ground and home of E. A. Drott near Tomahawk, Wis., modern equipment adds a new touch to the ancient ritual. Here a Drott Mfg. Co. Skid-Shovel, equipped with log-loading rack and mounted on an International TD-9 tractor, proudly carries the family Christmas tree aloft and drags behind a sled load of greens for trimming. Proving-ground operator Paul Lotz is running the rig, and his busy helpers are neighbors Laurence and Cheryl Bishop. Fitting right into this Yuletide picture is Susie, one of Drott's tame deer who roam the proving grounds at will.

WHERE EQUIPMENT IS
SUBJECTED TO IMPACT,
POUNDING ACTION
OR VIBRATION....



Johnson Station of Wolverine Electric Cooperative, Hersey, Michigan. Archt. & Engr. — J. & G. Daverman Co.; Contr. — Strom Construction Co.—both of Grand Rapids, Michigan. Engines grouted with Embeco; floors are tile red Masterplate.

EMBECO produces non-shrink, long life Grout.... helps avoid costly shutdowns

To avoid shrinkage — principal cause of failure in equipment grouts — plant engineers use Embeco*, the material that produces a *flowable grout which does not shrink*.

Whether it's engines, large machine tools, hydraulic presses, rolling mills, pulverizers, forging machines, mould shake-outs or other equipment subjected to impact, pounding action or vibration, Embeco will produce a grout that gives long and satisfactory service. Many leading equipment manufacturers and erectors recommend the use of Embeco.

In addition to counteracting shrinkage, Embeco produces easy placeability . . . sets in 6-12 hours . . . gives 7-day strength in 24 hours; 50% greater ultimate strength . . . insures full, level bedplate contact . . . maintains alignment . . . provides ductility.

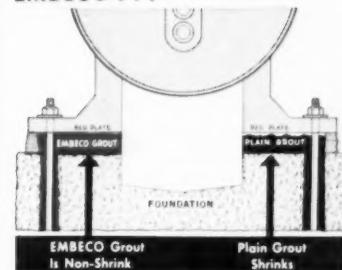
• • •

The Masterplate "iron-clad" concrete floor, illustrated at right, is produced at the time floor is installed or resurfaced. It has 4-6 times greater wear-resistance, is non-dusting, spark-safe and easy-to-clean. Non-colored and colored.

Full information on Embeco and Masterplate and "see-for-yourself" Masterplate demonstration kit supplied on request.

*Embaco is a combination of specially graded metallic aggregate combined with Master Builders cement-dispersing, water-reducing agent, calcium lignosulfonate, and ammonia free oxidizing agents.

EMBECO . . .



Cross-section shows how an easily placeable, flowable Embeco Grout counteracts shrinkage to produce full contact with bedplate.

MASTERPLATE . . .



the

MASTER



BUILDERS



CLEVELAND, OHIO

Subsidiary of American-Marietta Company

TORONTO, ONTARIO

Digs, hoists, swings fast...crawls smoothly

...with help of TIMKEN® bearings

IN designing the 150-B shovel, Bucyrus-Erie engineers saw that in certain bearing locations the going would be particularly rough. The shaft that turns the big propel sprockets. The crowd gear. A hoist shaft, a pair of swing shafts, a pair of intermediate crowd shafts. The loads were heavy and they needed rugged and dependable bearings—so they specified Timken® tapered roller bearings.

The tapered rollers and races of Timken bearings enable them to

carry radial and thrust loads in any combination. When a load hits the shaft, the bearings absorb it, yet continue to turn freely and frictionlessly.

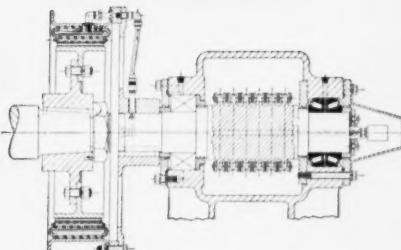
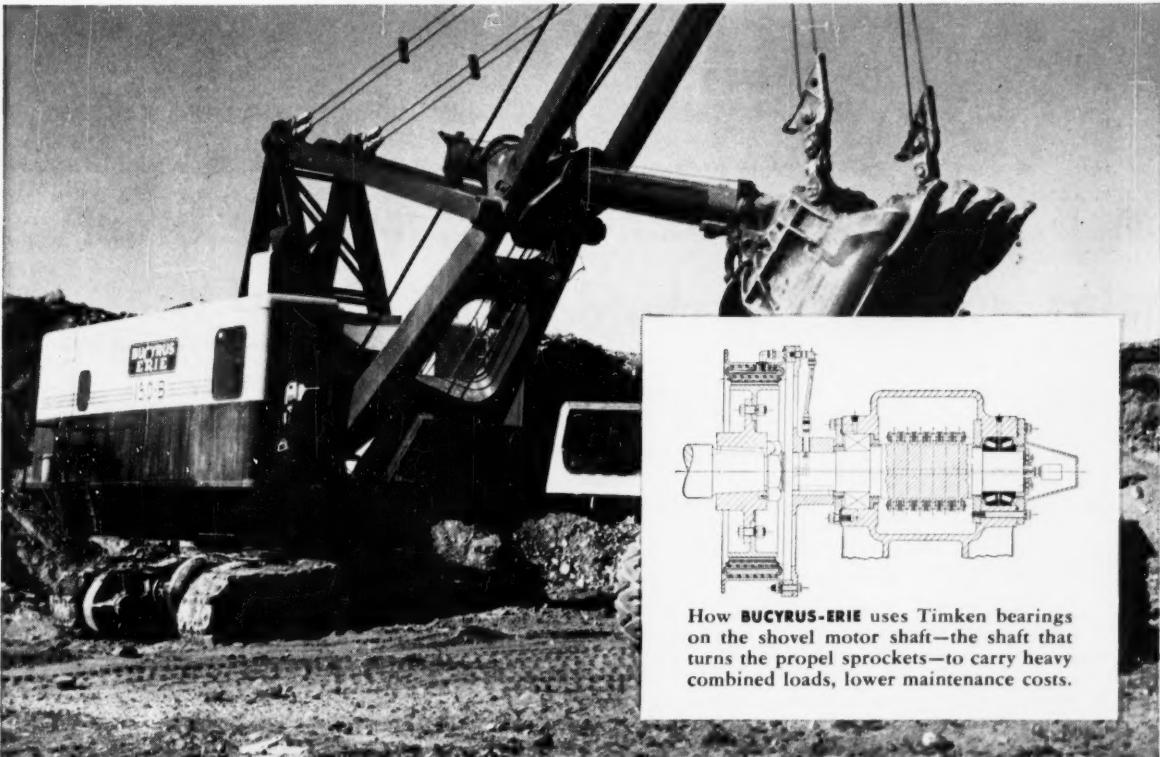
Because Timken bearings' case-hardened rollers and races have tough cores, they don't mind the shocks when digging in hard ground. Because they hold housings and shafts concentric, seals are more effective in keeping out dirt, dust and water—keeping lubricant in. Their long, trouble-free

life is particularly important where parts are so inaccessible and repairs would be a big and costly operation.

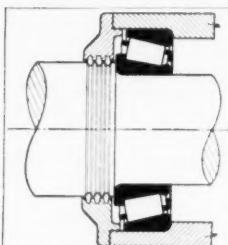
If you build machines, specify Timken bearings; if you buy them, look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".



This symbol on a product means its bearings are the best.



How BUCYRUS-ERIE uses Timken bearings on the shovel motor shaft—the shaft that turns the propel sprockets—to carry heavy combined loads, lower maintenance costs.

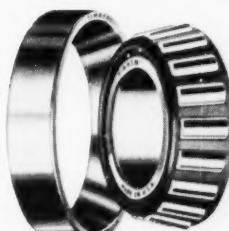


LUBRICANT STAYS IN —DIRT KEPT OUT

Because Timken bearings hold shafts concentric with housings, closures are made more effective. Lubricant is retained, dirt and moisture kept out.

The Timken Roller Bearing Company is the acknowledged leader in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

TIMKEN
TRADE MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION